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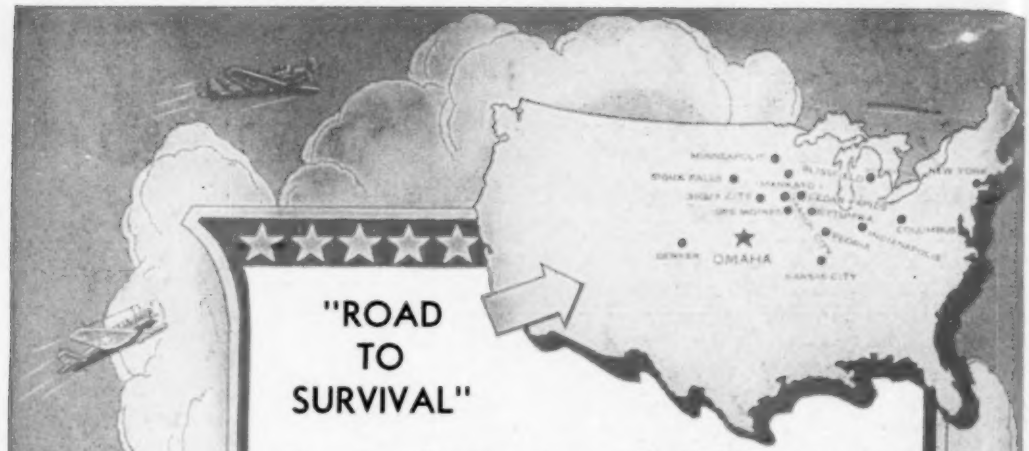

"ROAD TO SURVIVAL"

The Thought-Provoking "Book-of-the-Month"

by Wm. Vogt, authority on the capacity of the earth to provide for its steadily increasing populations, marshals the sober doctrines of veterinary medicine regarding the danger of mass hunger and ultimate starvation through the rapid mining of the land by mechanized farming, livestock reduction, and other wasteful practices.

"'ROAD TO SURVIVAL'," says Editor Kartman of *Coronet*, "should be required reading in America, Europe, Asia, and Africa," in order that its grim predictions may be acted upon in stride and the shortage of food already felt in every community prevented.

HOME OFFICES AND BIOLOGICAL LABORATORIES, OMAHA, NEBR.

THE MOUNTING HONOR ACCORDED TO VETERINARY MEDICINE ON ACCOUNT OF FRIGHTENING FOOD PROBLEMS IS A TOKEN TO GUARD AGAINST THE DEMOTING EFFECT OF NONPROFESSIONAL MORALITY IN THE COMMERCIAL AS WELL AS IN THE CLINICAL FIELDS.

SERUM PLANT, RALSTON, NEBR.

SERUM PLANT, 64TH ST. AND U ST., OMAHA, NEBR.

The Corn States Serum Co.

Omaha, Nebraska

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The President's Address

WILLIAM A. HAGAN
Ithaca, New York

I SOMETIMES wonder whether any of the generations that follow mine on this earth will see as many changes in the everyday life of the people as I have seen. Certainly I have seen more significant changes than any of my ancestors who lived during the last thousand years or more, unless it was the generation that spanned the first decade in the nineteenth century, when steam power ushered in the industrial age and the resulting urbanization of large numbers of people.

I have seen the kerosene lamp give way to gas, and gas to the electric arc light, and this to the incandescent lamp. I have seen the telephone develop from an interesting toy to an everyday necessity. I have seen the horse replaced as a means of travel and a beast of burden by the motor car and the motor truck. I have seen the entire development of the airplane, from the earliest flimsy models of fabric and piano wire, to which only a few dare-devils would entrust their lives, to the great metal airliners of today which transport millions of everyday folk to all parts of the earth with phenomenal speed, in comfort, and with a high degree of safety. I have observed the entire development of wireless telegraphy and telephony down to the modern radio and television.

Nearly everything that has been done to control the infectious diseases of man and animals throughout the world has been done during the life span of persons now living, and the majority of it has been accomplished during my own lifetime. The first virus recognized, that of the mosaic disease of plants, was described in the year of my birth. The science of immunology has largely developed during my sojourn here. Sanitary science and immunologic methods have brought the great human and animal plagues under control in the more enlightened parts of the world and the recent developments in chemotherapy with the sulfonamides and the antibiotics now make it possible to effectively treat many infections

Dr. William A. Hagan

Address delivered at the Eighty-Fifth Annual Meeting of the American Veterinary Medical Association, San Francisco, August 16, 1948.

that had not been controlled by previous methods. Excluding traumatic accidents, neoplasms and the degenerative diseases are now the most frequent causes of human deaths. The infant born today has a life expectancy about 25 per cent greater than I had when I was born. Sanitary science, immunology, and chemotherapy likewise have made it possible to control most of the acute infectious diseases of animals.

All of these changes have come about as a result of research—the persistent search for new information about the intimate workings of nature. We have come far, but doubtless we will go much further as time goes on. Man's recent success in liberating the energy of the atom promises great developments in the future. We can only guess how far these will go. We are now seized with a fear that these great sources of power may be misused by mankind perhaps for his own destruction. Scientific research not only has been a great boon for mankind but it has also contributed greatly to the destructiveness and deadliness of warfare. Social research has not kept pace with research in science. Fervently we hope that a balance ultimately can be achieved and the family of man can learn to live together in peace and happiness to enjoy a life free of drudgery and the constant struggle for the needs of material existence.

Veterinary medicine is one of the oldest of all professions. Like other vocations, it changed little during the thousand years before the middle of the nineteenth century. Actually, most of the significant changes have occurred during the last seventy-five years. The developments in the fields of chemistry and physics, of bacteriology and pharmacology, of physiology and pathology, have done much to provide a scientific rather than an empirical basis for medicine, both human and veterinary. Much of the experimentation that has led to modern concepts of the nature of diseases and to specific medication was done on animals. Animals as well as man have been the beneficiaries of the practical application of this knowledge.

Advancement in a profession is manifested first in the standards of the schools in which its members are trained. It is the function of professional schools to implant basic ideas, concepts, and habits of thought in the minds of their students. True, there must also be implanted a certain store of basic facts, but these are less important than an understanding of the processes by which new facts are discovered, for if the graduate is to be a worthy representative of his profession he must constantly, throughout his life, be a student. He must constantly learn new facts by observation and deduction from things he already knows. We feel sure we know much more today, and are better able to cope with most of our animal diseases, than did our colleagues of previous generations. This fact itself should teach us not to be too complacent about our present knowledge for those who follow us are sure to find that many things we believe today are really fallacious.

VETERINARY EDUCATION IN AMERICA

In discussing the condition of the veterinary profession today it is logical that we begin with the veterinary schools.

As all of you know, the public has become very much interested in the veterinary profession in recent years. This is exemplified best, perhaps, by the tremendous number of young people who are now seeking to enter the veterinary colleges of North America. After the proprietary colleges left the educational field about the time of World War I, only ten subsidized schools in the United States and two in Canada were left. For more than a decade these schools hardly had enough students to justify their existence. Suddenly, in the early thirties, large numbers of candidates for admission began to appear. The numbers of these rapidly increased, year by year, until the time of World War II, during which there was some recession. Since the end of the war, the number of applicants has been very great. This has been due in part to stimulation by the so-called G. I. bill in the United States and a similar measure in Canada, but it is certain that there would have been a great excess of applicants over the number that could be accommodated even had there been no measures of these kinds. In 1947 it is highly probable that a smaller proportion of the total number of applicants for admission to veterinary colleges were able to gain admittance than for any other profession.

The pressure from applicants, rather than the need for more veterinarians, al-

though this need certainly exists, has been the principal cause for the formation of a number of new veterinary colleges in the United States during the last three years. This fall there will be 17 veterinary schools operating in the United States, and it is likely that still others will be started next year.

There can be no doubt but that many more veterinarians are needed and can be absorbed in North America. For producing more veterinarians more schools are needed, since there are definite limitations to the number of students that individual schools can properly handle. The increase in the number of schools has been the proper development in order to meet the situation, but the growth is not a healthy one since it has occurred too rapidly. Too many of the new units have been set up hastily without appropriate physical plants, equipment, and adequate faculties. The lack of properly trained faculty personnel is by far the most serious problem facing these new schools and many of the old schools as well. This is a problem that will not be solved for some years, for the supply is inadequate and it cannot be supplemented quickly. Already some schools have found it necessary to place young, inexperienced men in important teaching positions because they have not been able to find and attract competent men.

Without reference to the number of schools that eventually we should have to insure an adequate supply of graduate veterinarians for the country, it seems perfectly clear to me that the good of the country will not be served by the formation of additional veterinary schools at this time. In many states, individual veterinarians and veterinary societies have been influential in obtaining legislation for the formation of new schools, and such agitation is now going on in a number of states. In my opinion, they are not acting in the best interests of their state or the country in urging the formation of schools that cannot be adequately staffed under present conditions.

Higher Admission Requirements of Veterinary Schools

In the fall of 1949, most of the veterinary schools in the United States will require two years of preveterinary collegiate work for admission. This step probably would have been taken at least five years sooner had it not been for the war. It should be understood that the new entrance requirement will not diminish the number of students in veterinary schools, even temporarily, for there are far more persons already possessing the increased qualifications clamoring to obtain admission than can be admitted next year.

The two year preveterinary admission requirement will not only make it possible for the veterinary schools to require better preparation in chemistry and physics than previously, but the students will be a little more mature and they will have the opportunity to broaden their educational bases. A veterinary education is not a liberal one; it is a narrow, specialized one. If veterinarians are to hold their own with other educated people they need to know something of history, economics, government, psychology, and other subjects included among the humanities. Prospective veterinary students should be advised not to load their preveterinary years with sciences only, as many have a tendency to do under the mistaken idea that this is best since by so doing they can demonstrate to admitting authorities their ability to do well in scientific studies. Such students sacrifice their only chance for broadening their educational base. I may say in passing that some institutions that have laid out hard and fast preveterinary curriculums apparently have a hazy idea of the purposes of the additional year, judging from the types of courses specified.

Better Clinical Teaching Needed

The Council on Education of this Association has sent a visiting committee to inspect every veterinary college in the United States and Canada at least once during the last two years. The newly formed schools have not been included in these visits since they are incompletely staffed and equipped. It is intended that they will be subjected to scrutiny only after they have four classes and are operating a complete curriculum.

The inspectors for the Council have purposely been critical, but it has been intended that the criticisms would be constructive and useful to the administrative officers of the institutions. Deficiencies have been found in all schools. In several in-

stances, these have been of such a critical nature that the schools have been given probationary approval. The most frequent and most serious deficiencies have been in the clinical teaching. In some cases, the volume of the clinics have been too small for the number of students the school is attempting to teach. In other instances, the men in charge of the clinical teaching have been inexperienced and their work of low quality. Most of the institutions have appreciated the criticisms, and many of the faults have been corrected or attempts are being made to correct them. Several of the schools have made great improvements during the last few years partly, at least, as a result of help that the Council has given them. On the other hand, there are instances in which the schools have not accepted gracefully the criticisms of the Council, and have made no apparent effort to correct faults which have been pointed out. It seems likely that the Council may find it necessary next year to bring such cases to the attention of the Association.

Even in the best conducted veterinary schools, there is too wide a gulf at present between the preclinical and the clinical subjects. In the insufficient amount of time that is allotted to clinics, in the wide ratio that commonly exists between the number of instructors and the number of students, and in the semi-hostile attitude of some clinical teachers toward the use of laboratory procedures in diagnosis, lie the roots of a general failure of our present schools to turn out a better class of practitioners. Unlike the clinical instruction in our medical schools, that of veterinary schools generally requires too little of the student. He is not taught to study his cases, using his powers of observation fortified by laboratory studies. Usually, the diagnosis is made for him by the instructor, while he stands idly by. Treatment is specified by the instructor and passively accepted by the student. This system leaves too much to be learned after the student has graduated. It is not any wonder that older practitioners, who came up under such a system but had the advantage of being members of much smaller classes and thus received closer attention from their instructors, feel that our present day graduates need some plan of internship training.

The instruction that veterinary students receive in our better colleges in anatomy, physiology, bacteriology, and pathology is just as good as that to which medical students are exposed in our best medical schools. The medical schools are doing a good job in carrying into the wards all of this basic instruction whereas this is not being so well done in veterinary schools. If the basic instruction is not to be applied to the diagnosis and treatment of animal ailments, what is the use in giving it? Before it can be used, clinicians will have to discard the obsolete idea that "it isn't practical" to make use of more than the unaided senses in arriving at diagnoses. These are sufficient in the majority of cases, of course, but if we, as a profession, are to claim to be practitioners of scientific methods, we must use whatever means science has given us in reaching specific, accurate diagnoses, and the special senses alone are not enough in many cases. Even if it were to be granted that veterinary practitioners cannot always use elaborate, time-consuming procedures in dealing with their cases, the student should be made to appreciate the value of such aids, and in using them while in college he will acquire a better understanding of the nature of disease than he now develops. I know some very busy practitioners who find time to conduct some simple laboratory procedures themselves. I know others who make frequent use of publicly supported or privately operated laboratory facilities. Some have trained technicians who operate laboratories for them. In general, the small animal practitioners use laboratory facilities much more effectively than country practitioners for obvious reasons. But there are too many practitioners, of both types, who have little appreciation of the value of laboratory help and are satisfied with nineteenth century methods. Such men frequently complain of competition from persons who lack a veterinary education. Have they a strong case? The practitioner who uses intelligently the education that he was given usually doesn't worry much about competition from untrained persons.

Some of the veterinary schools are in process of changing their clinical teaching methods to make the student an active participant in the thorough study of patients. To be successful in this, the student must be given more time for it, and he must be very closely supervised. This means that there must be one clinical instructor for

each four to eight students, the smaller the number the better. There must be an ample number of cases, and the number of students per class should be gauged by the number and variety of clinical cases that are available. It is my opinion that no veterinary school should have more than fifty students per class. Certainly, none in North America has either an adequate staff or an adequate clinic to train properly more than that number.

INTERNESHIPS IN VETERINARY MEDICINE

Since there has been much talk of internships in veterinary medicine, I take this opportunity to pursue this subject a little further. This talk has been stimulated by obvious deficiencies of young graduates which stem, I believe, from inadequate clinical training in the basic course. The interneship in medicine serves the purpose of giving the medical graduate practical training in clinical medicine as a young assistant on a hospital staff where he works under the direction of a group of medical specialists. It is not possible to duplicate this situation in veterinary medicine since, with few exceptions, we have no hospitals with staffs of considerable size. Interneship in veterinary medicine would mean, in most instances, studying under the preceptorship of single individuals. Such training could not be standardized or adequately supervised and for these reasons I am opposed to the idea as a part of the training for the veterinary degree. As a matter of fact, only a few medical colleges in this country require interneship training for the M. D. degree. Most of them grant the degree upon the completion of the four year basic course. Most states, however, require a year of interneship training in an approved hospital for a license to practice. In the same way, state veterinary licensing boards might, if they saw fit, withhold licenses for independent practice until the candidates had provided satisfactory evidence of having had a year's practical experience with a licensed practitioner. Since the legal right of these persons to practice veterinary medicine, even under the tutelage of a licensed individual, might be questioned in some states, the recent graduate might be granted a limited license when he has passed his state board examination.

A NATIONAL BOARD OF VETERINARY EXAMINERS

At the meeting of the House of Representatives this year the question of establishing a national board of veterinary examiners will come up for final consideration. The establishment of such a board is a forward-looking step which should be approved. A workable plan has been developed by a special committee which has given the matter very careful consideration. Details of this plan have been presented previously, hence, it should be well understood; yet it appears that some have not yet grasped its purpose and significance.

The proposed board is modelled on similar ones that already operate for some of the other professions, including the medical profession. The new board will not usurp any of the functions of the present licensing boards, since the latter will retain their authority in their respective states. The state boards will decide, each for its own state, how fully or how little they wish to use the new facility.

If a National Board of Veterinary Examiners is set up, it is intended that it shall operate on a high plane, its examinations being rigid, thorough, and fair. It is hoped that ultimately its diploma will be endorsed by many state boards, which will thus accept the examination in lieu of their own. This will save veterinarians who have occasion to move from one state to another the necessity of taking new examinations each time they move to another state. After all, this is a single country and there are no good reasons why professional standards should vary greatly in different states, or why a single examination shouldn't suffice for all. In the beginning, it is not expected that this examination will be accepted by a large number of states but the number will grow as its advantages are better understood.

THE AVMA PUBLIC RELATIONS PROGRAM

We all hear much about the fact that the public does not fully appreciate the important rôle that the veterinary profession plays in our national economy; that veterinarians seldom receive as much credit as they deserve for the good work they do, and that when veterinarians do make the news column for meritorious accomplish-

ments, they frequently are disguised as "livestock disease experts," "animal pathologists," and "government experts." There is a basis of fact for this feeling, and yet I believe that many of us are unnecessarily sensitive about this matter. The veterinary profession has come a long way in the public estimation during the last twenty years. This can be proved in many ways but as convincing as any to me are the large numbers of applications that veterinary schools are receiving, and the diversity of social groups from which these applicants come. The public does not clamor to get into groups unless it thinks well of them.

No profession can lift itself by its boot straps, and no amount of advertising will continue to sell a poor product. The rise in public estimation that the veterinary profession has enjoyed has been due largely, I think, to improvements in the profession itself. Every member of our profession is an *ex officio* member, for better or for worse, of the Committee on Public Relations of the AVMA. Every member of our profession is playing a part in enhancing or degrading its reputation with the public, for public opinion is only the composite of many private opinions each of which is formed through contacts with one member, or at best, a few members of the profession.

I do not want to be understood as believing that veterinary organizations need do nothing but encourage better service as a means of building public opinion. In a society as complicated as ours has become, each group pursues its own objectives with little attention to those of others. Each has found it to be desirable to let others know what it is doing and what it is capable of doing, partly for selfish, egotistical, and commercial reasons, and partly that the world may know and avail itself of the special services that it renders. The veterinary profession needs to be aware of the desirability of acquainting others with its work.

When several groups are concerned with different aspects of a single objective, conflicts and frictions often develop. Sometimes these are difficult to reconcile, but very often they have their basis in the failure of groups to know and understand each other; often these are easily settled in conferences.

Veterinarians have their share of such conflicts. At various times in the past we have heard of conflicts between veterinarians, on the one hand, and county agricultural agents, druggists, vocational agricultural teachers, feed dealers and others, on the other hand, for what the former thought were infringements on legitimate veterinary practice. We have talked much among ourselves about these injustices, but apparently we have made little effort to talk with those with whom the differences occur. The logical thing, it seemed to your committee on public relations, was to seek opportunities to confer with some of the groups with which the profession occasionally has conflicts, and this was made one of the projects for the last year.

In furtherance of this program, your president has accepted several invitations to address national, nonveterinary groups interested in the development of the livestock industry of the country. These have included the National Association of County Agricultural Agents, the Texas and Southwestern Cattle Raisers Association, and the National Association of Feed Manufacturers. My reception at all of these meetings was cordial, good program spots were allotted me, and excellent attention was given to what I had to say. As a result of a suggestion made in the address to the county agents' association, a conference later was held between members of our public relations committee and their livestock committee. National officers of both associations were in attendance and participated in the discussions. The conference dealt with the practicing veterinarian-county agent relationship. A very frank and friendly discussion, lasting a full day, was held. The combined groups had no difficulty in arriving at unanimous agreement on a set of principles which, if used as a guide, should eliminate most frictions between these groups. In due time, you will be more fully informed about these principles.

As a result of information obtained on questionnaires circulated by our committee on public relations, it became known that the relationships between practicing veterinarians and county agents have improved greatly in recent years. This questionnaire made it evident, however, that friction spots occurred and perhaps were increasing in number between veterinarians and teachers of vocational agriculture, and particularly between those who were attempting

teach veterinary subjects in service rehabilitation schools. Contacts were made with the chief of this service in Washington and the situation was discussed. The attitude was friendly and coöperative. Arrangements have been made to have a conference in Kansas City in October between the top government executives and our public relations committee to discuss this matter in detail.

I believe that these and similar contacts with other groups with which we have differences cannot fail to redound eventually to the benefit of the profession. All of the groups with which I have talked have recognized the need for a first class veterinary service in the United States, have expressed the wish to work with us to make veterinary services available wherever needed, and to help practitioners earn a fair living in marginal areas by the discouragement of untrained and half-trained competition.

An Additional Full-Time Staff Member Needed

I believe that the time is at hand when the Association should add another veterinarian to its full-time staff to lessen the load on Dr. Hardenbergh, Dr. Merillat, and Dr. Klussendorf. Earlier, the new place was thought of as one for public relations work only and, in time, I think we should have one man whose principal activities will be devoted to this field. For the present, however, it seems best to use the new employee to supplement the staff, in order that all may have less routine and may give a part of their attention to additional activities. In other words, it is suggested that the new employee be trained in all phases of the Association's work in order that he may substitute for staff members while on vacation, and be available in case of illness or resignation of a member of our professional staff.

The demand for program speakers from our affiliated state societies has become increasingly heavy in recent years. It is to our interest, I think, to accommodate these groups so far as this is possible. The president is in greatest demand. It is an enjoyable experience for him to attend these meetings, but also it is very time consuming. I have not attempted to accept all of these invitations this year, yet I have found it difficult to keep a full-time job going and to meet a reasonable number of these demands in addition. The job of the president of the AVMA has become more than a casual one that can be discharged with a few hours of attention during the year. Probably, we should do something about lessening these duties or, otherwise, we will find that many men who merit the honor of the presidency may not be able to accept it because of the time required for it. A larger central office staff that could be called upon to meet a larger part of the speaking load would be one help in this direction. The president-elect and members of the Executive Board might be used in this way also.

The Veterinary Advisory Committee on Civilian Defense

The Association was requested in April to appoint a veterinary advisory committee on civilian defense, the chairman of which was to act as a member of the National Medical Civilian Defense Planning Committee. The primary function of this committee is to prepare plans for the handling of medical problems of defense under the changed conditions of the atomic age. These plans are under way at the present time.

Recently, this committee was given an additional assignment in connection with the newly enacted Selective Service Act. Most matters concerning the relationship of the veterinary profession to the Selective Service System will be handled through this committee; thus it will assume a function somewhat similar to that of the Procurement and Assignment Agency during the last war. As these words are written, no directives have been issued from Selective Service Headquarters on this matter, but I am glad to be able to tell you that tentative plans are to handle members of the veterinary profession, veterinary students, and preveterinary students in the same way as the comparable groups in medicine. Since the numbers needed by the armed forces are much smaller now than during wartime, deferment policies will be much more liberal than before. Veterinary students, otherwise eligible for military service, will be deferred, and preprofessional students who can obtain tentative acceptance by any recognized veterinary school will likewise be eligible for deferment.

CIVIL SERVICE SALARIES FOR VETERINARIANS

It seems obvious that the large group of veterinarians who serve the Bureau of Animal Industry of the U. S. Department of Agriculture need help in obtaining classifications equivalent to those which other professional groups obtain in the U. S. Civil Service. It is well known that the Bureau needs veterinarians very badly to carry out the services with which it is charged by Congress. The general letter sent out by the personnel officer of the Bureau on July 14, 1948, soliciting applications is recent evidence of the situation. I am informed that the work of the Bureau in Mexico, its Meat Inspection Service, and its field services are seriously handicapped by lack of man power.

The general shortage of veterinarians is primarily responsible for this situation, of course, yet it is not to be doubted that more young veterinarians could be induced to enter federal service as a career if the pay scale were better.

Young veterinarians with less than one year of service must enter the bureau service in the P-1 grade at an annual salary of $2,974.80. After four months of satisfactory service they are advanced to the P-2 grade at $3,727.20 per year. If they have had one year of experience as a veterinarian in any capacity, they may immediately be appointed at the P-2 level. The chances for advancement are said to be excellent.

I have not heard many complaints about salaries in the more advanced positions although there are some. The principal cause of irritation is that physicians, dentists, pharmacists, and even laymen with little formal education are initially appointed by some government agencies in grades higher than the bottom, whereas most veterinarians have to begin at the bottom or very near it. Apparently, it is possible under the civil service rules to appoint men with highly technical educations at levels needed to compete with nongovernmental services, and this needs to be done with veterinarians. The AVMA should investigate this situation and bring its influence to bear in correcting the inequalities that appear to exist.

RESEARCH ON DISEASES OF PET ANIMALS

Less research on the diseases of dogs and cats has been done than on those of farm animals. The federal and most state governments are spending a great deal of money on the latter but little or none, so far as I know, on the former. The monetary value of the pet animals of the country is not known, and their numbers have only been estimated. Their sentimental value, however, is undoubtedly great.

Public funds for research on diseases of pet animals will be made available only when pet owners organize to make their wants known to the custodians of public funds. The numbers of animal lovers in urban as well as rural areas, who are tax payers and therefore entitled to have something to say about the spending of public funds, can certainly obtain some appropriations for the purpose if they organize to do so.

Many pet owners are persons of wealth, who might be expected to contribute to private funds for the prosecution of research on pet animals if they were properly approached on the subject. The fund collected by *The Field*, a British sporting magazine which supported the work on distemper by Laidlaw and Dunkin, is an example of what can be done.

Recently interest in this approach to the problem has developed. The National Canine Research Foundation is an organization with this object in view. Veterinarians should encourage its development. Better control of that scourge of dogdom, that complexity of ailments known loosely as canine distemper, is certainly needed. Various nervous diseases that may or may not be associated with distemper infection present a series of problems that will be solved only by research. Canine leptospirosis is a serious dog disease, with public health significance, that we know little about as yet. These diseases, particularly those that involve the nervous system, will not be controlled soon unless we have substantial financial support to enable rather extensive and well controlled research to be done.

In concluding this address, I want to thank the officers and employees of this Association for unfailing and effective support during this past year. Also, I want to present my warmest thanks to the members of all committees who have labored diligently and well. Finally, I want to offer to you, the members of the American Veterinary Association, my heartiest thanks for the honor conferred last year in electing me as your president. Lack of time has pre-

vented me from doing many of the things that I thought a year ago that I would do. I have done the best I could with the time I had and the ability that I possess. I think we have made some progress during the year, thanks mostly to the efforts of others than myself. It has been an experience that I shall always remember with pleasure and gratitude.

World's Medical Association

At a meeting of its Council in New York City on April 26 to 29, the World's Medical Association chose the New York Academy of Medicine at 2 East 103rd Street as its permanent headquarters and, in behalf of the General Assembly, elected Dr. Louis H. Bauer as the general secretary. The WMA was formed in Paris last September and the next session will be held in Geneva, Switzerland, Sept. 8 to 11, 1948. The organization was assured substantial support through contributions of professional societies, of 37 member associations, and of industrial groups and individual medical practitioners. Its gigantic undertaking is the improvement of human health on a global scale. Present were delegates from Cuba, China, India, France, Spain, Czechoslovakia, Sweden, Great Britain, and the U.S.A. All doubt expressed at the Paris session as to the possibility of harmony was dispelled by the patience and tolerance displayed in debates on difficult subjects.

In the range of topics discussed was the war crimes problem stemming from the German betrayal of traditional medical practices during the Hitler regime set forth by the United Nations War Crimes Commission and the recent savagery of the Arabs toward Jewish medical units and their patients. The Council issued a declaration condemning the brutality of the Arabs in which doctors, nurses, and patients were massacred.

The iron reserve stored in the liver of a pig at birth usually is exhausted after about seven to ten days, unless sources of iron other than the sow's milk are provided.

The recent contention of Greenwald that iodine lack has nothing to do with goiter is entirely untenable.—*Nutr. Rev., Feb., 1948.*

The National Research Council

Information concerning the National Academy of Science and its working unit, the National Research Council, is obviously quite vague among the rank and file of the veterinary profession. The National Academy of Science was established under President Abraham Lincoln in 1863 "to investigate, examine, experiment, and report upon any subject of science or art whenever called upon by any department of the government."

The working unit, or National Research Council, was established under President Woodrow Wilson in 1916 "to stimulate research in the mathematical, physical, and biological sciences and the application of these to engineering, agriculture, medicine, and any other useful arts with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare."

In referring to the NRC, Dr. George H. Hart (*California Vet.*, March-April, 1948: 20-21) writes: "At the present, we [the veterinary profession] have the National Research Council, the action body of the National Academy of Science, having various committees and spending a considerable amount of money in behalf of veterinary medicine and veterinary service."

It is truly worthy of note that both of these significant steps in behalf of science were inspired at critical periods of American history when national security was uppermost in mind, and also that in times of national tranquility the tendency of Congress has been to reduce the appropriations needed for the normal development of the sciences and for their maximum service to the country.

Summed up in terms of 1948 knowledge of international affairs, it seems timely to hold to the opinion that the country that would now desert science to play around with the liberal arts does so at the peril of its own welfare.

Cooking of meat from cattle fed DDT-treated hay did not materially alter or destroy DDT in the meat, federal studies showed (*Science*, April 2, 1948).

Chickens cannot produce hard-shelled eggs on a calcium-deficient diet.

Some Highlights from Papers

delivered at the

85th Annual Meeting, San Francisco, Aug. 16-19, 1948

General Sessions

Ethics is defined as the science of morality. A man's profesional ethics should be his most sacred possession and zealously guarded throughout his professional life, not to please his colleagues but to satisfy his own conscience.—*S. W. Haigler, D. V. M.*

Normal chickens were infected with the viruses of laryngotracheitis and pneumoencephalitis by the inhalation of air containing these viruses in the dust-borne state or in the form on droplet nuclei.—*K. B. DeOme, Ph. D.*

The ideal of veterinary medicine is prevention, and the necessity for curative treatment is a tacit admission of its failure. The whole profession of practitioners [should] become the exponents of preventive as well as curative veterinary medicine.—*K. F. Meyer, D. V. M., M. D.*

The most fundamental problem of veterinary life is education, and if progress is to be maintained, we can never be content with things as they are. . . . The government [of Great Britain] realizes that the veterinary profession must in future play a much greater part in the maintenance of British agriculture.—*W. M. Mitchell, M.R.C.V.S.*

Radioactive isotopes may be applied to any of the subjects comprising the field of veterinary medicine, and it is almost certain that they will be applied directly to veterinary science by their use as research tools.—*L. M. Julian, D. V. M.*

Those animals (goats, pigs, rats) surviving immediate detonation at Bikini appeared healthy for several days, although the white blood cell count decreased promptly and rapidly. Symptoms included skin changes, vomiting, diarrhea, inappetence, irritability, purpura, and a progressive weakness.—*Col. W. O. Kester, V.C., and Major E. B. Miller, V.C.*

Section on General Practice

Positive diagnosis of bovine venereal trichomoniasis requires demonstration of the etiologic agent, *Trichomonas foetus*, in samples of genital exudate from bulls and breeding females. In bulls, it is important that samples for examination are collected from the proper source. In females, it is important that samples are collected at the proper time in relation to exposure.—*D. E. Bartlett, D. V. M.*

There are indications that the diarrhea occurring in the foal about the time of the first heat of the mare after foaling (ninth day scours) is not a disease, although it may be so complicated, but the natural adjustment of the bacterial flora in the intestine of the foal.—*Major B. F. Trum, V. C.*

In raising calves, a feeding program should include the feeding of colostrum, a starvation and laxative period, and a controlled system of feeding, whether by regulated hand feeding or feeding calves on nurse cows.—*W. J. Gibbons, D. V. M., M. S.*

Our small hospital adds something worthwhile to the community. It is a credit to the profession and is surely a pleasant place from which to carry on.—*A. E. Erickson, D. V. M.*

Well-planned field surgery can be as successful as hospital surgery. It is as easy, and far less expensive, to carry the necessary surgical instruments and equipment to the home of the patient as to transport a large animal to the hospital.—*C. Harvey Smith, M. D. C.*

Laboratory tests and procedures are valuable aids in the diagnosis of certain diseases or conditions, but they are not a substitute for clinical methods of diagnosis. Before employing one of these tests, there should be manifested some clinical indication for its use.—*C. F. Schotthauer, D. V. M.*

The anesthetic of choice for most major operations performed on animals of the equine and bovine species is chloral hydrate. The addition of magnesium sulfate will tend to produce a more desirable anesthesia.—*W. M. Coffee, D. V. M.*

Immunity to ovine enterotoxemia (pulpy kidney disease, overeating disease) can be obtained from the injection of one dose of *Clostridium perfringens* type D bacterin.—*E. M. Baldwin, B.S., D.V.M., M.S.*

Section on Sanitary Science and Food Hygiene

Brucellosis of bovine origin is a definite problem in rural populations and among those people who drink raw milk. This disease can be placed at the head of the list of those which originate in the udders of cows and which are

of public health significance.—*I. A. Merchant, D.V.M., Ph.D., M.P.H.*

In the United States, we are concerned with 25 diseases which may be transmitted from animals to man, of which three stand out as important threats to public health. They are brucellosis, encephalomyelitis, and rabies.—*J. H. Steele, D. V. M., M. P. H.*

The rabies eradication program is based on the control of stray animals by the local community, the immunization of all dogs which reside in the community, and the reduction of infected wild animal reservoirs.—*J. H. Steele, D. V. M., M. P. H.*

Cattle, particularly milk cows, are the only definitely known source of human infection with Q fever, but the means by which cattle acquire and transfer the infectious agents is not yet understood.—*R. R. Parker, Ph.D., Sc.D., LL.D.*

The coöperation of the veterinary practitioner is essential in any public health program which is to serve the needs of a community adequately.—*J. D. Vagneur, D. V. M.*

Symptoms of listerellosis in cattle and sheep included fever, facial paralysis, circling movement, depression, prostration, and death. Some cases recovered.—*R. Jensen, M. S., D. V. M.*

We should understand and appreciate the early history of the Army veterinarian, his duties, and the transition leading to the organization and administration of the present Veterinary Corps of the Department of the Army.—*M. V. Starnes, D. V. M., M. P. H.*

Every consumer of meat and dairy products depends upon our profession for adequate inspection of these foods to insure their wholesomeness and edibility.—*H. E. Kingman, Jr., D. V. M.*

Histoplasmosis is a disease of man and his animals. It is caused by *Histoplasma capsulatum*, a fungus, and it is being studied intensively to improve the methods of controlling its spread.—*J. S. Ruhe, M. D., M. P. H.*

Section on Research

Experiments conducted during the past five feeding seasons have shown that sulfur fed continuously with the grain ration has a definite prophylactic action in the control of enterotoxemia in feedlot lambs.—*A. W. Deem, D. V. M., M. S.*

Clinical trials have been conducted on a small scale using crystalline bovine serum albumin. This substance has been used effectively in human medicine in combating cases of shock and dehydration.—*H. S. Cameron, D. V. M., Ph.D.*

Cattle fed ensilage made from pea vines grown in fields where nightshade (*Solanum nigrum*) was grown developed marked nervous symptoms.—*J. N. Shaw, B. S., D. V. M.*

Weaned lambs maintained on a ration lacking in vitamin A rapidly lost weight, the serum vitamin A and protein fractions of the blood fell to low levels, and they frequently developed pneumonia. Yearlings on similar rations showed incoördination and pica.—*D. F. Eveleth, B. S., Ph.D., D. V. M.*

There is a marked decrease in the fecal androgens of cows with cystic ovaries, but present evidence indicates that the ovary itself does not have a direct effect on this.—*R. B. Casady, B. S., Ph.D.*

Mink and ferrets are moderately susceptible to the toxins of *Clostridium botulinum* types A and B, highly susceptible to type C, but immune to type E.—*E. R. Quortrup, D. V. M.*

Depending upon the weight of the pigs under observation, as the air temperature increased the respiration rate and the rectal temperature also increased, while pulse rate decreased.—*H. Heitman, B. S., Ph.D.*

The synthetic anionic detergents are remarkably effective bactericides against gram-positive organisms, and pathogenic staphylococci and streptococci are rapidly destroyed by concentrations lower than those ordinarily employed for general cleaning.—*E. C. McCulloch, D. V. M., Ph.D.*

Cold weather helps to prolong the life of *Vibrio fetus* which causes vibrionic abortion in sheep. This may explain why most cases of such trouble occur during the colder months.—*R. W. Lindenstruth, D. V. M.*

An age factor does not play a decisive rôle in the spread of *Streptococcus agalactiae*, and therefore the inclusion of sanitary and segregation programs for the control of mastitis is sound.—*R. Ormsbee, D. V. M.*

Section on Small Animals

Differential diagnosis of intestinal disturbances in dogs is based on three simple, clinical tests: direct microscopic examination of the feces, rectal culture, and flotation test.—*J. E. Craige, V. M. D.*

Dogs may be kept in positive nitrogen balance by the administration of amino acids both orally and parenterally. Amino acids may be used to supply nitrogen for tissue repair as well as for supportive treatment during recovery from acute illness.—*O. H. Siegmund, D. V. M.*

Interstitial nephritis occurs commonly in dogs. Leptospirosis causes characteristic kidney disease and may be responsible for much of the interstitial disease seen.—*D. L. Coffin, V. M. D.*

Open reduction and internal metallic fixation by means of screws and plates for the long bones, and of hip nails for the neck and intertrochanteric areas is gradually becoming an accepted practice.—*Kenneth Townsend, M. D.*

Cats fed the processed foods developed degenerative diseases. Though the original stock was healthy, the animals reproduced offspring with poor skeletal structure. By the fourth generation, cats fed processed foods exclusively were unable to reproduce.—*F. M. Pottenger, Jr., B. A., M. D., F. A. C. P.*

Most authorities are of the opinion that histamine or H-substances are released from the tissues during the antigen-antibody reaction that forms the principal of characteristic symptoms of allergy in lower animals and in man.—*G. W. Rawson, D. V. M.*

The animal research which has been carried out indicates that our patients frequently suffer from neuroses and illnesses brought on by anxiety. Pavlovian researches have been based on the conditioned reflexes in animals.—*L. C. Moss, B. S., D. V. M.*

A treatment for *Dirofilaria immitis* in dogs, involving a study of the blood picture changes which occurred, has decreased the mortality to such a point that treatment is no longer considered much of a risk.—*F. J. Kingma, D. V. M., M.Sc.*

Section on Poultry

A list of the fundamental causes which render meat unwholesome are given and an explanation of the application of this material to the poultry inspection job.—*P. J. Brandly, D. V. M.*

The mechanism by which the estrogens improve the quality of poultry meat is not thoroughly understood but may include: a direct stimulation of lipogenesis, an effect on basal metabolic rate, and/or a general quieting of temperament through suppression of masculine characteristics.—*F. W. Lorenz, B. S., Ph.D.*

The virus of pneumoencephalitis (Newcastle disease) may be modified for the production of vaccine by injecting allantoic fluid into the yolk sac of embryos, by passage in the allantoic cavity of duck embryos, or *in vitro* by tissue culture technique.—*J. R. Beach, D. V. M.*

Vaccination procedures should aim to decrease the incidence of the disease (Newcastle disease) and not merely to maintain the same or, perhaps, develop even a greater incidence in birds of a given age at a time when the disease might be less severe in them.—*H. E. Moses, D. V. M., M. S.*

Many disease problems are so complicated that, to solve them, the complete coöperative efforts of the animal attendant, the veterinary clinician, and the laboratory staff are needed.—*E. E. Jones, D. V. M.*

Sulfathiazole, sulfanilamide, sulfapryridine, sulfamerazine, and sulfadiazine are of no value in the prevention and treatment of the respiratory form of fowl cholera.—*J. P. Delaplane, D. V. M.*

The economic aspects of coccidiosis control with sulfa drugs is a problem of importance not only to investigators but to the poultry industry as well.—*E. M. Dickinson, D. V. M., M.Sc.*

Continuous sulfa medication may foster among poultrymen an unwarranted confidence in the medication, with a lack of emphasis on basic hygiene and sanitation.—*C. A. Brandly, M. S., D. V. M.*

A single strain of Newcastle virus was selected for vaccine production because of its inability to produce a high incidence of paralysis or a high mortality, when injected intramuscularly into chicks about 5 weeks of age.—*F. R. Beaudette, D. V. M.*

Section on Surgery and Obstetrics

Authentic records on horse breeding have been kept. Observations include: rate of conception and foaling; classification of each abortion and early death according to cause; typing of genital infections to determine relative importance; and many others.—*Lt. Col. Wm. E. Jennings, V. C.*

There is need for the development of a working relationship between the artificial insemination units and the practitioner. The means by which this relationship may be established

was presented. There is need for specially trained veterinarians within the breeding organizations.—*Greg R. Raps, D. V. M.*

The addition of riboflavin to the ration will prevent the outbreak of new cases of equine periodic ophthalmia but will have little or no effect on the old cases. Recrudescences will be observed in the established cases, even while riboflavin is being fed.—*Major T. C. Jones, V. C.*

The problem of the clinician is not to get involved with the complications of research in the field of endocrinology but, rather, to take the factual information definitely established and carefully apply it on selected cases as an aid to other forms of treatment and management practices.—*G. H. Hart, V. M. D., M. D.*

When thinking of feeding a ruminant, or administering medicine to it any time during the period from birth to maturity, a knowledge of the changes which are taking place at that stage of development becomes important.—*J. D. Grossman, G. Ph., D. V. M.*

The rumenotomy operation is perhaps the most commonly performed and useful one in the field of bovine surgery, whether for the removal of foreign bodies of the reticulum or emergency relief of an overloaded rumen.—*C. H. Seagraves, D. V. M.*

A lower than average breeding efficiency was associated with diseases of the reproductive organs, and retention of the fetal membranes was a common accompanying process.—*W. M. Thorning, D. V. M.*

Particular emphasis is placed on tatooing as a method of permanent identification of race horses. Such identification may be used in avoiding fraud in the sport of racing.—*J. N. Frost, D. V. M.*

Predisposing causes of dystocia in the sow may be: conformation, feed, management, exercise, etc. Correction of the condition involves drugs, manipulation, and surgery. Aftercare of the patient is important.—*F. B. Young, D. V. M.*

Veterinary Medicine and the Food Supply

Inasmuch as the foremost objective of veterinary medicine is conservation of man's alimentation, no group is more intimately concerned in the world's disturbing food problem than the constituted veterinary profession. Faced with the task of helping to feed hungry millions, we of that vocation are not deceived by the overall difficulty of that undertaking. There are more mouths to feed than there are acres to feed them. *Essays on the Principles of Populations* by Thomas Robert Malthus (1798), which points out that populations grow faster than food production, although not written for our edification, is a fine piece of veterinary literature.

Although in the last 150 years, steam, electricity, machinery, and agricultural and veterinary science postponed the evil hour Malthus predicted, Nature was not asleep. Populations kept increasing until they now severely threaten to outrun the mechanical contraptions, and diseases of plants and animals have crept in to complicate the production of food. We cannot close our eyes to the 3,900,000 babies born in the U. S. A. alone in 1947, nor to the millions of pounds of food snatched from mouths of the human race by its parasitic enemies.

A syndicated column in the *Chicago Daily News* has recently asserted that India's gain of 50 million people since 1930 accounts for Britain's release of that 450 million souls to their own fate. More to the point is the task of helping to feed the 270 million people of western Europe who, for decades out of mind, have had to exchange the output of their factories for enough animal and human food to carry on.

Most certainly, our 140 million of the world's 2.5 billion people can do but little to permanently ameliorate the global food shortage. What is coming to light, not for the first time but more clearly, is that the human race has always lived along the borderline of food shortages. That fact in veterinary medicine has been unchangeably fundamental. The founding of formal veterinary education stemmed therefrom. Never has veterinary medicine had foolish dreams of abundance in the face of the fixed limits of food production on the one hand and the continued increase in populations on the other. Veterinary medicine has never been misled by any mirage of big stockpiles, knowing that shortages and famine with every drought or heavy rain are common occurrences everywhere on every scale of severity and geographic scope.

The Koch Glyoxylide Treatment

We take cognizance of the Koch treatment because the Hon. William Langer, Senator from North Dakota, has placed in the Congressional Record of the Eightieth Congress a discourse on this subject, and has mailed copies of his remarks to veterinarians in all parts of the United States. We take this means of answering questions which have been referred to us.—ED.

In 1938, the Bureau of Investigation of the American Medical Association abstracted and revised an item which had first appeared in the AMA Journal (*107*, (Aug., 1936): 519). It reports receipt of a letter from Koch Laboratories, signed by William F. Koch, Ph.D., M. D., and J. G. Warnshuis, M. D., advertising and describing a product termed "the most important recent achievement in medicine" and which they had named glyoxylide. In this letter, the promulgators of the product claimed to have demonstrated its efficiency not only in the "treatment of cancer, but also in such infections as tuberculosis, psoriasis, leprosy, poliomyelitis, and syphilis."

In 1918, William F. Koch of Detroit was graduated in medicine by the Detroit College of Medicine and Surgery. He had been an assistant in physiology and an instructor in histology in the University of Michigan Medical School. He also had been professor of physiology in the Detroit College of Medicine and Surgery. Less than a year after his graduation in medicine, Dr. Koch announced that he had "developed a real specific cure for cancer." His thesis at that time seemed to be that cancer was caused by a microörganism resembling the spirochete of syphilis, but he has since expressed the belief that at least some forms of cancer are of virus origin. He claimed that he had developed a differential poison — Koch's Synthetic Antitoxin—that would destroy the "cancer germ" without injuring the host. The American Medical Association says: 'There is, however, plenty of information regarding individuals who 'promptly died' after taking the treatment."

Nature of the Product

The exact nature of glyoxylide is not stated in the advertising letter, but it is elsewhere described as an unsaturated diketone having the structural formula O = C = C = O. No experimental or clinical evidence was submitted to support the claims for its usefulness in treating the several diseases enumerated, and the promotional material comprised testimonials in lieu of case histories which are essential to scientific reports.

The nature of the product and its mode of action are discussed in some detail in "The Koch Treatment and the Use of it on Dairy Cattle in the Chilliwack Area," an essay submitted by W. Bruce Richardson, a senior student in the College of Agriculture, University of British Columbia, in partial fulfillment of the requirements for the degree of bachelor of science in agriculture, in 1947.

It is postulated that instead of devoting the major effort in the study and treatment of animal diseases to the fostering of means of increasing the acquired immunity, more attention should be devoted to the enhancement of natural immunity. The Koch theory holds that normal, healthy, animal tissues contain substances called metabolites which prevent and abolish basic tissue pathology. Metabolites are described as "diffusible bodies of small molecular weight held in adsorption by the lecithin cephalin fractions of the tissue extracts, from which they can be removed by dialysis." These metabolites exist in very small quantities and they may be destroyed in various ways by physical, chemical, thermal, or biologic means. A defect in the fundamental biochemic reaction initiated and maintained by these metabolites predisposes the tissue to disease.

The metabolites were first produced by a complex method of extraction from animal tissues, but later synthesized from the sulphonic acid derivatives of ethyl ether, paraldehyde glucose, and fructose. The end product is the internal anhydride of glyoxylic acid, and is called glyoxylide for convenience.

Method of Treatment

Glyoxylide is packaged in small glass ampules, in 5-cc. doses. The full dose is considered one treatment for an animal the size of a mature dairy cow. The material is injected intramuscularly with a special hypodermic syringe, and a needle of large bore is used. The muscles of the neck are preferred.

Directions specify that the product should be protected from the light but need not be refrigerated. It should be used only in the syringe furnished and within three months of the date of issue. The ampules and the syringe should be stored where they will not be subjected to strong odors—tobacco smoke, drugs, ammonia—and the glyoxylide should be transferred from the ampule to the syringe only

outside the barn in fresh, clear air and then injected at once.

The person giving the treatment should wash his hands in clean warm water, using no antiseptic or strong-smelling soap. The hands should then be rinsed in clean water. The site of injection is not washed with antiseptic, alcohol, or even soap and water.

The amount of protein in the ration of the animal to be treated is reduced, and no silage should be fed to the dairy cows while they are under treatment.

THE THEORY OF ACTION

The theory of operation of the Koch treatment is discussed in the 1946-1947 report of the British Columbia Department of Agriculture. It says:

> It is Dr. Koch's belief that certain carbon compounds perform an important intermediary step in the living chemistry by which food is turned into life itself; and should the supply of these compounds fall below that requisite for the best conditions, life may continue, but vigorous good health may be lost.
>
> It is Dr. Koch's belief that a normal supply of these essential carbon compounds often can be renewed by the hypodermic administration of the reagents which he discovered.

The first of these beliefs is in line with the accepted conception of biochemistry. But doubt arises in connection with the ability of a 5-cc. injection of a 1:1 trillion dilution of any carbon compound to produce the remarkable results claimed for glyoxylide. If the dilution quoted—one molecule so small that it is invisible in each 300 million gallons of water—is even approximately correct, what chance does a 5-cc. dose have of getting any portion of that molecule?

FEDERAL LITIGATION

The *Detroit Free Press* for Sunday, April 5, 1942, reported that federal agents arrested Dr. William Koch and Louis Koch. At that time, Assistant United States Attorney John C. Ray is quoted as saying, with reference to the synthetic antitoxin of Koch Laboratories, that

> a thimblefull of this liquid sells for $25 to practitioners and they get as much as $300 from patients. Chemical analysis shows that the dilution is so infinitesimal that it would be like dumping a cocktail in the Detroit River at the foot of Woodward and expect to get a kick out of the water going over Niagara Falls.

The *Free Press* reports further:

> Doctors said it was something like a molecule, so tiny that it can't be seen, to every 300,000,000 gallons of water.

A letter from Dr. H. E. Moskey, acting chief, Drug Division, Federal Security Agency, Food and Drug Administration, Washington, D. C., dated Dec. 18, 1944, contains the following paragraph:

> According to the label the product Benzoquinone consists of 1 part of Benzoquinone to 1 million parts of water, and the product Glyoxylide consists of 1 part of Glyoxylide to 1 trillion parts of water. The Bureau of Animal Industry kindly cooperated with this Administration in conducting a test with such a Benzoquinone preparation for mastitis of cattle, and Dr. Robert Graham of the University of Illinois also conducted some tests with both the products Benzoquinone and Glyoxylide for mastitis of cattle and Bang's disease. All of these tests showed the products to be utterly worthless for the treatment of these disease conditions.

The first action, reported above, was taken under the provisions of the Federal Food, Drug, and Cosmetic Law, and on 11 specific charges under the Law. On May 22, 1942, Judge O'Brien of the United States District Court for the Eastern District of Michigan granted a temporary restraining order

> to cease advertising that glyoxylide is a competent or effective preparation for use in treating any type or stage of cancer, arteriosclerosis, dementia praecox, epilepsy, tuberculosis, septicemia, insanity and other ailments; that "B-Q" is effective for use in treating any infection including gonorrhea, sinusitis, meningitis, infantile paralysis, streptococcus sore throat, pneumonia, and other diseases; and that malonide ketone solution is effective treatment for allergic diseases, infections, diabetes, cancer, double pneumonia, or post operative meningitis.

The case was the longest in the history of the Food and Drug Administration (19 weeks), and the court transcript ran well over 9,000 pages, with an additional several thousand pages of depositions. The case went to the jury which was unable to reach an agreement after deliberating for eight days, and was discharged. A poll taken after the discharge showed nine for conviction and three for acquittal.

A second trial was held in 1946. It, also, resulted in the taking of many pages of

testimony and in failure to reach an agreement.

EXPERIMENTAL REPORTS

In October, 1944, the British Columbia Department of Agriculture outlined a series of regulations for diagnosing and treating mastitis to test the Koch treatment. No provision was made for control animals; every case found in the experimental herds was to be treated.

The Koch Laboratories were represented by D. H. Arnott, M. D., on a committee which also had representatives from the British Columbia Veterinary Association, the University of British Columbia, the British Columbia Department of Agriculture, and the several breed associations. In the field work, G. F. R. Barton, B. V. Sc., of Chilliwack, represented Dr. Arnott and the Koch Laboratories, and he was present when each dose of the treatment was administered and when each milk sample was taken.

In the report of the British Columbia Department of Agriculture for 1944 and 1945, this Committee reported on 27 individual cases of mastitis treated with the glyoxylide solution. The report lists only total bacteria count, with no attempt at identification or classification as to pathogenicity. The individual cows vary, as they have in practically every routine survey of milk samples taken at weekly intervals. The best response is recorded for a cow with a count that was reduced from 18,000,000 before treatment to 25,000 subsequent to treatment. The poorest response was in a cow with a pre-treatment count of 20,000 and a post-treatment count of 12,500,000. Of the cows reported, 20 showed a reduced bacteria count, while 7 showed a higher count.

For the following year, the Committee reported on 71 cases treated. Of these, 39 are listed as recovered; but 19 are then listed as recurrent. The table shows further that 20 cases were treated a second time, and 19 treatments were unsatisfactory. In a list of ten conclusions drawn by the Committee, the following italicized statements appear: "*A consistent result was a definite softening of the udder after treatment. The disappearance of fibrous tissue was noticed in a considerable number of cases. In no case was any other treatment used in conjunction with the Koch treatment.*"

Concurrently with the mastitis treatment, 29 cows were treated for sterility or infertility. Of these, 21 were pronounced pregnant and 8 failed to respond. The noteworthy observation was made that the response was equally good in anestrous cows and in nymphomaniacs.

The report of the British Columbia Department of Agriculture for 1946 says: "Since the close of the Government's Koch treatment investigation, . . . it appears that a considerable number of veterinarians within this province are using the Koch (glyoxylide) treatment with satisfactory results. The recent reduction in the cost of glyoxylide has enabled many dairy cattle owners to subject their whole herds to the treatment."

The 1946-1947 British Columbia report says that Johne's disease also has been successfully treated with glyoxylide. It says:

> Here is what happened: An outbreak of a fatal unidentified disease in a herd brought an investigation by the staff of the Ontario Veterinary College. To assist this work, they slaughtered another sick cow and the disease then was identified by postmortem examination to be Johne's disease. Under supervision of a member of the staff of the Ontario Veterinary College, tests were made which revealed the presence of the disease in 8 other cows. The experts who made the diagnosis of Johne's disease advised the owner to dispose of all affected animals, to protect the rest of the herd. However, he decided to use the Koch treatment.
>
> On April 19, 1943, the Koch treatment was injected, and repeated twice, at weekly intervals. No other treatment was employed and nothing further was done.
>
> Six weeks later the entire herd again was given the clinical test. Another animal was found positive to the test. Of the 8 found positive at the first test, and subsequently given the Koch treatment, 4 were found negative, and therefore should be regarded as having been cured of the disease. They have improved in condition and are milking well.

Although this report was printed in 1948, there is no further word about this herd which was treated in April and May of 1943. Additional information in this connection would have significant scientific value.

The *Common-Tater* (*4*, Jan., 1948), 405 Railway Ave., Vancouver, B. C., contains three articles on the Koch treatment by D. H. Arnott, M. D., W. A. Gooder, and S. N. Wood, D. V. M., respectively. The *British Columbia Farmer and Gardener* has printed items by Dr. Arnott in March and June, 1947. *Butterfat*, issued by the Fraser Valley Milk Producers' Association, published an item by Dr. Wood in March, 1947.

EXPERIMENTS PROPOSED

In March, 1948, Dr. Arnott addressed a meeting of farmers and business men at Imlay City, Mich. As a result of this meeting, a committee was appointed to encourage experimental work under the direction, and at the expense, of the State of Michigan.

The Committee is composed of representatives from the Chamber of Commerce, Rotary Club, Artificial Breeders' Association, Lapeer County Coöperatives, Inc., and Michigan Milk Producers.

This Committee arranged interviews with officials of the Michigan Department of Agriculture and with Michigan State College. These officials suggested that in order to get a fair and unbiased evaluation of the product, glyoxylide, an experiment should be set up at the College under recognized research conditions. The initial experiment suggested by the faculty members and research workers was to be limited to mastitis, with gradual expansion into other fields as the value of the product justified. However, Dr. Arnott and the Committee favored a supervisional and observational type of field study of numerous ailments, notably mastitis, brucellosis, acetonemia, and sterility. The College had neither the personnel nor the financial means for pursuing so broad an experiment. Moreover, the members of its faculty believed that the great need is for detailed information which can be obtained only by using intensive methods recognized by modern research groups.

The Committee then decided to carry on more extensive but less intensive tests and observations on the four or more diseases. They have enlisted the support of the Dow Chemical Co. to promote this field trial. Dr. L. T. Dawe, a private practitioner at Capac, Mich., will supervise or make the injections, and will make pretreatment and post-treatment observations.

We would urge that observations be made in accordance with the accepted American research and field trial methods, and that they be in sufficient detail to permit a distinction to be made between the true medical facts and the testimonial statements which are frequently based on observations made during periods of emotional stress. We admit to a degree of skepticism, because previous reports have not been in sufficient detail to make such a distinction, and because there appears to have been a concerted and premeditated effort to keep glyoxylide out of the hands of members of veterinary college faculties who are familiar with the criteria on which the medical value of a treatment must be based.

A cow in Walsh County, N. Dak., produced nearly 23,000 lb. of milk last year on a ration which utilized 25 lb. of chopped cull potatoes daily.—*Am. Hereford J., June 1, 1948.*

Atomic Bombing Effects on Food Require Study

Science Service, one of America's leading press sources for popular scientific news, recently emphasized the need for more knowledge of the effects of an atomic bomb explosion on meat, milk, and forage crops, and cited the part veterinarians will be called upon to play in this picture.

"A population could 'conceivably' survive an atomic bomb attack only to face slow starvation because so much of its food supply had become contaminated with dangerous radiation, a report from the American Veterinary Medical Association stated." The quotation is part of a story that appeared in hundreds of daily papers and in *Science News Letter* (April 24, 1948: 265). The report drew attention to the statement by Brig. Gen. James A. McCallam, V.C., that "Veterinary Corps personnel and civilian veterinarians must become the nation's first line of defense against this danger."

Information for this release was supplied to Science Service by the AVMA public relations department. Purpose of the story was to show that the veterinary profession is intimately concerned with atomic dangers to animal health and public health. Nuclear physics is headline news because it is a top-ranking factor in our national economy, and there are many people who will step in to take over the veterinarian's rightful rôle in this field unless the AVMA and individual veterinary leaders make it known —through information such as this public relations project disseminates — that the profession is alive to its responsibility and willing to do the job.

Electron Microscopy of Semen.—Inasmuch as the heads of spermatozoa contain the chromosomes, their dimensions are important in the study of fertility, but owing to their smallness, only the longitudinal axis can be measured with ordinary microscopy. The heads have specific dimensions and forms in the different species. With the aid of electron microscopy, Bretschneider (*Tijdschr. Diergeneesk.*, 7, 1948: 233) was able to disclose the presence of previously unknown elements bearing upon the dimensions and forms of sperm-cell heads, and also their malformations. — *Abstr. Rec. d. Méd. Vét., 124 (June, 1948): 275.*

Danish Veterinary Practice

J. EGEHOJ

Graasten, Denmark

WHEN LEAVING the Royal Veterinary High School, Copenhagen, as an approved veterinary surgeon, many possibilities are open. In the course of the next two or three years, the young veterinarian must decide which branch of the profession to choose as a working field. Although the approval endows the graduate with the privilege of practicing in all branches of the veterinary profession, practical experience shows that, owing to the multiplicity of duties and the continuous demand of specialization, this is nearly impossible. For example, one person cannot engage in general practice and in meat inspection. Today, the varied fields of the veterinary profession demand specialization.

It is natural for most young veterinarians to wish to enter general practice. This branch of the profession seems attractive to them because here, more quickly than in other fields, the young veterinarian becomes his own manager. Before establishing his own practice, the veterinarian usually spends two or three years as an assistant to one or two established veterinarians in order to learn the routine of work in veterinary practice. Many graduates spend two or more years, before or after the assistantship, working in artificial insemination as this work presents excellent training in diagnosing and treating disturbances of fertility in cattle. Others, with hygienic interests, become assistants to the veterinary inspecting staff of a slaughterhouse or of the veterinary staff supervising the milk supply for Danish towns and cities. In this way they become specialists in some field of the profession, and after six to ten years may secure a position as chief of the veterinary staff in that field.

Some veterinarians become engaged in scientific work, serve as assistant professors at the Royal Veterinary High School, or enter the civil veterinary administration. However, these categories have but few members because of the special training needed.

The most comprehensive field of work of Danish veterinarians is that of the general practitioner. In rare cases, it comprises all kinds of veterinary science. But, as a rule, the practitioners of the villages and smaller towns are engaged mainly in treating sickness in the domestic animals, especially in horses, cattle, and pigs. The ailments of dogs, cats, and fowl are but rarely subject to treatment because of their small economic importance to Danish husbandry. In the last two decades, diseases in fowl have become an exception in regard to the epizoötic infectious diseases where blood samples for serologic examinations are taken by veterinarians. These examinations are made in the laboratories of the veterinary Serumlaboratorium, Copenhagen, as routine work under leadership of veterinary specialists. In addition to the treatment of sick animals, the practicing veterinarians are obligated to coöperate with the public authorities in controling epizoötic infectious diseases in domestic animals appearing in Denmark. Not to be forgotten is the rôle Danish practicing veterinarians play in combating and eradicating tuberculosis, infectious abortion [brucellosis], mastitis, and larvae of the warble fly.

In the last decade of the nineteenth century, B. Bang, coöperating with the general practitioner, N. O. Nielsen of Remkolde, proved it possible to eradicate tuberculosis from infected cattle herds by means of his stamping out method, combined with rigorous isolation of the infected animals. But nearly thirty years elapsed before Danish farmers were ready to harvest the fruits of this coöperation between the famous Danish scientist and a diligent and modest Danish veterinarian. Not until the second decade of the twentieth century, subsequent to the introduction of the intradermic tuberculin test, did the combat of tuberculosis in cattle become established on a broad front in the form of planned work between members of the coöperative Danish dairies. Today, only some few herds in the southern part of Jutland at the

Chief of the staff of inspecting veterinarians of the Graasten public slaughterhouse and coöperative butchery.

German border still remain tuberculous. Elsewhere, we have been successful in eradicating this plague.

When it became evident fifteen years ago, that tuberculosis could be controlled, it was decided to attempt to eradicate the second major disease in cattle, to which the name of B. Bang is also connected, *i.e.*, brucellosis or infectious abortion (*Brucella abortus*) in cattle (previously called *Bacillus abortus* Bang). This disease had already been successfully controlled in Norway. The principles for the combat of the disease there were transferred to Denmark with apparent success.

Further, the practicing veterinarians play an important rôle in protecting Danish cattle and pigs against foot-and-mouth disease. Since our foot-and-mouth disease vaccine became available for field use nearly fifteen years ago, there have been only isolated cases of the disease scattered throughout the country. Since then, the plague never has assumed epizoötic character, due to the effective preventive power of this vaccine. Veterinarians vaccinate in areas exposed to infection.

In recent years, practicing veterinarians have been interested in combating bovine mastitis due to streptococcic infection. The campaign is carried out as a combination of hygienic measures, including isolation of infected animals and treatment with modern antibiotic substances, especially penicillin. As far as can be seen, these measures may in many cases lead to eradication of this inflammation from infected herds.

And finally, practicing veterinarians in Denmark play an important rôle in the eradication of the warble fly.

Meat inspection in public and coöperative slaughterhouses is carried out exclusively by veterinarians authorized for this service by the Ministry of Agriculture. In order to remain independent of the owners or managers of the slaughterhouses, these veterinarians are paid directly by the public authorities. In this way, it is assured that the slaughtered animals will be judged in accordance with stringent scientific ininspection. In smaller slaughterhouses, the inspection is carried out by a single veterinarian; in larger slaughterhouses, the staff of inspectors comprises more veterinary surgeons under the leadership of a chief inspector. Common to all is that they, before beginning to work at meat inspection, must have approval and authorization by the Ministry of Agriculture. Only in this way are veterinarians allowed to serve as meat inspectors, as well as to conduct all investigations of slaughtered animals when it is necessary to judge whether or not the meat of a slaughtered animal is fit for human consumption. Such inspection must be performed only by authorized veterinarians who judge whether the meat is to be exported (without any further treatment or after curing or preservation as canned goods) or is to be used locally.

Milk inspection is carried out under the same principles, *i.e.*, the staff of milk-inspecting veterinarians is led by a chief appointed by the public authorities as are the veterinarians assisting him in his work, whether in the laboratories or in the stables.

In Denmark, laymen are not allowed to carry out any part of the hygienic or other investigations necessary in the supervision and the inspection of milk and meat or other animal foods.

Censoring Medical Writings

The *British Medical Journal* is perturbed over the possible danger in government censorship of medical writings "if doctors become servants of the state in the National Health Service." The fear is as old as government itself, and was never lost sight of among democratic people. Heads of bureaus, departments, and services could hardly maintain discipline within their command if every Tom, Dick, Harry, and Jane wrote what they pleased regardless of adopted policies or acceptable facts. Speaking only for veterinary medicine, supervising the literary output of veterinarians in federal or state employment has never endangered the efficiency of any branch of applied veterinary science. On the contrary, the censored output is the most authentic material submitted to veterinary journals for publication, and represents research in its highest estate. It seems that there are better arguments against state medicine (human) than the free press issue.

Timothy hay is a poor source of cobalt even on soils where cobalt is plentiful, whereas the clovers and alfalfa are good sources even on cobalt-poor soils.

The History of Veterinary Medicine in Japan

MAJOR KENNETH F. BURNS, V.C. U. S. Army

SINCE the beginning of time, human beings and animals have been closely related. When people began to colonize in groups for self-preservation, they thought of their friends of the lower biologic groups, and when these animals became ill, man's desire to cure them was natural from a practical and even sentimental point of view; particularly so if these animals were maintained as beasts of burden.

The history of veterinary medicine in Japan, beginning in prehistoric times, can best be described by dividing it into four periods or eras, commencing before the reign of Emperor Suiko (595 A.D.) and ending during the reign of Emperor Hirohito.

The first period, the cure-by-magic era, existed from time immemorial to Emperor Suiko's reign in 595.

During the second period, 595 to 804, the Korean or, more precisely, the Koma veterinary methods were used. Old Korea once comprised the three independent countries of Koma, Kudara, and Shiragi. The methods used at that time originated in the country of Koma.

During the third period, 804 to 1861, the Japanese used the Chinese and Dutch methods of veterinary therapeutics; and during the fourth or last period, 1861 to 1937, they employed European methods.

CURE-BY-MAGIC PERIOD

The origin of Japanese veterinary medicine is traced to ancient days when, according to mythology, Prince Omiki, considered the founder of Japanese veterinary medicine, is said to have "cured a rabbit's peeled skin" by putting Kaba ears, a kind of pampas grass, on it. Even today, Kaba grass ears are used for making ointments.

"Nihon Shoki," the oldest Japanese history book, describes farmers reporting cases of infectious diseases in their horses and cows to the government and asking for veterinary care. The emperor ordered Prince Koyayawata and 16 other "deities" to study "veterinary treatments." Subsequent to their completed studies, Prince Okatateiwa and seven nobles were sent to the agricultural districts of Japan to teach. Since many similar records are found in the "Nihon Shoki," apparently veterinary medicine—cure-by-magic methods—existed in Japan in prehistoric times.

KOMA PERIOD

In 595, during the reign of Emperor Suiko, Crown Prince Shotokutaishi controlled national politics in behalf of the emperor. Being clever and well versed in both foreign and domestic culture, he planned for national prosperity by importing foreign civilizations. In 598, a priest, Keiji, "well trained in horse veterinary," came from Korai, Korea and was the first veterinarian from a foreign country to be admitted to Japan. The prince ordered a courtier, Tachibana, to study veterinary medicine with Priest Keiji. Tachibana, in return, established a veterinary school in Korea—the "Prince School"—which was the origin of "Koma veterinary" in the Far East area.

Since there is no record of a foreign veterinarian visiting Japan, or, of any veterinary treatment prior to Priest Keiji's visit (other than cure-by-magic methods), it is probable that venipuncture, moxibustion, and internal medicine were taught by the priest. With the increase of government horses and the gradual recognition of veterinary science, veterinarians were added to the official staff.

In the Taiho laws issued by Emperor Bunbu in 701, the official ranks of masseur, veterinarian, pharmacist, and milkman are found among the pharmaceutical department employees. On the official staff, there were 50 milkmen and four veterinarians in two of the emperor's stables.

Records show that, during the reigns of Emperor Gansho (718) and Emperor Shomu (749), court veterinarians were treated as civil officials of good professional standing, and an official veterinary system of the Japanese government was established for the first time during that period.

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This paper was made possible through the assistance of Mr. Shui Fujimori, who compiled the reference material for translation, and Mr. Y. Kumano for his extensive translations of scientific periodicals.

CHINESE AND DUTCH PERIOD

During Emperor Kammu's reign in 805, a knight, Nakakuni Taira, was sent to China to study veterinary medicine with Taien. After a long stay, Nakakuni returned home and established an institution bearing his name. Later, he and his two sons published a book, "A Hundred Questions and Answers in Veterinary."

In Emperor Junwa's reign in 827, the number of tribute horses, horsemen, and veterinarians on the official staff was established. During Emperor Yozei's reign in 877, a veterinarian, Kotaku Kiyo-uchi, made an official report to the emperor on the number of tribute horses treated.

The Enki government regulations, issued by Emperor Daigo in 898, mention in the paragraph on "Hirano festival" that when an emperor visited the Hirano shrine, one Shinto priest and one veterinarian were included in the emperor's suite. Concerning "horse's medicine," mention is made that "in every spring season, 6 gallons of sesame, about 3 gallons of vegetable oil, ¼ gallon of boar's fat, and ⅛ gallon of sulfur shall be given to each horse."

In 978, Yasuyori Tamba published 30 volumes of medical writings, entitled "Ishinpo," chiefly derived from the Chinese doctor So-genho's book on pathology, "Byogenko Ron." The "Ishinpo" describes conditions and treatments simulating hydrophobia. This is the oldest known description of the disease in Japan, but neither this nor any other book records a real existence of the malady until centuries later.

Certain old records mention that during the feudal civil wars, every war lord was accompanied by a veterinarian. A book, "The Bogu Yosetsu" (war equipment), graphically portrays a veterinarian incising a horse's tendons or muscles to improve the contour of its legs. This is probably one of the earlier records of tenotomy as it is practiced in veterinary medicine today.

Dog Protection Laws.—During the seventeenth century, Shogunate (feudal war lord) Tsunayoshi, out of his kindness for animals, built a stable at Yotsuya (Tokyo) to accomodate all sick horses in that area. Shortly thereafter, he issued the famous dog protection laws, which stated that "anyone who injures a dog shall be given the death penalty, and any person who kills an animal shall be beheaded and exposed at a public place, and become an object of severe public criticism and contempt."

During this period, the veterinarians who were on the government staff had great power and dignity and were always attended by six retainers or servants: a box carrier, a shoe carrier, two body-guards, and two carriage courtiers. When an animal whelped, the dog's owner had to report to lower and higher government officials, and a "dog doctor" was called to attend the case with "great care and technique." The animal was fed delicacies; a score of persons acting as servants attended it day and night for two weeks; and on the twenty-first day, by a veterinarian's direction, the dog's owner and others took it out for a stroll to "restore former strength." If the animal died and no reasonable explanation was given, the owner was given a death sentence or banished to a far-off island.

During this period, a celebrated small animal specialist, Heisuke Imagawa, accumulated a great fortune from his practice. According to the records, his success in small animal therapy was due to a plaster consisting of urine and red beans. If this failed, dry grass was soaked in urine for one hundred days, then washed with water for three days and dried; this concoction was then applied topically and given orally with such an outstanding recovery rate that it was not confined to veterinary practice but was given as human medicine also.

For almost thirty years this unnamed society for the prevention of cruelty to animals existed but, in January, 1704, with the accession of Shogunate Ineroi, the dog laws were abolished.

Dutch and Chinese Influence. — During the late seventeenth and early eighteenth centuries, the Chinese and particularly the Dutch influences were carried to Japan.

The expression of veterinary medicine during this time was based upon 15 volumes (anonymous) of Dutch veterinary literature owned by Marquis Shimazu, containing chapters on internal diseases, surgery, and animal conformation.

In the chapter on surgery, this information appears on castration: "When a horse is castrated 1 or 1½ years old, it becomes effeminate, and fit for battle fields. So except a commander, all warriors ride on geldings. Castration is to be done in warm March or April, and have to be kept in

stables until its complete cure." (Japanese translation.)

For the first time, a veterinarian, Takeki Fujiwa, studied Dutch veterinary medicine. Apparently, emphasis was placed on dissection and anatomical terminology because, subsequent to Fujiwa's graduation, he published two volumes on "The New Dissection of Horses."

Early Horseshoes. — When the British minister arrived in Japan in 1858 to open the ministry, he brought with him some 25 horses as mounts for his bodyguard. Prior to arrival of the British, the Japanese protected the hoofs of their horses with straw sandals (this exists today). Due to British influence, the Japanese started to make horseshoes of powdered iron plus powdered bracken. After this mixture was placed on the ventral surface of the hoofs, sheets of paper were placed on top of it, and a hot iron applied until the mass was dried. Such a covering apparently gave some protection.

With the passing of the Tokagawa feudal government (*ca.* 1861) and during the last days of Shogunate Keiki, the system of "retainer veterinarians" and official stables was abolished. With it passed much of the splendor and pagentry of the government.

EUROPEAN PERIOD

In 1870, the Japanese government sent two agricultural officials to the United States to be trained in animal husbandry. Before they returned to Japan, they engaged the services of an American, Dr. George A. Etchhall. Later, Dr. Etchhall established an experimental farm at Komaba, a Tokyo suburb, for the importation and breeding of purebred horses. The Ministry of Education, in 1872, proposed to the prime minister the establishment of veterinary schools with a curriculum of three years of preparatory work and two years of veterinary medicine. This curriculum included zoölogy, physiology, anatomy, internal treatment, surgery, veterinary experiment, translation, and physical exercise. Based upon veterinary education as we know it today, the entire program is about the equivalent to the first-year of our veterinary colleges.

To bolster its scientific staff, the Japanese government in October, 1876, sent to England for professors in the various scientific fields, including veterinary medicine, farming, chemistry, agriculture, commerce, and English.

Dr. John Adams MacBride was the first veterinary professor to arrive in Japan as a result of these efforts. Dr. MacBride immediately founded a veterinary school at Shinjuku, Tokyo, starting instructions in January, 1878. In 1881, the first students were graduated from this school. At a later date, the Shinjuku school was incorporated as the Veterinary Department of Tokyo Agricultural College, Tokyo University.

The Military Influence.—We are not reminiscing when we revert to the year 1871 because, concomitantly with the establishment of civilian veterinary institutions, the army opened an office in Tokyo and in Osaka Military Hospital, where veterinarians were to be trained exclusively for military careers. Veterinary medicine and equipment were financed from the military budget. At a later date the veterinary status, salary, and uniforms blended into that of the military.

Due to the prominence of France in world affairs at this time, the military system and veterinary medicine of Japan were patterned after those of that country. A plan to invite veterinarians from France was proposed to the government. In April, 1874, a veterinary surgeon, August Ango, came to Japan and established a school for army veterinarians.

The regulations and curriculum of the army veterinary school were issued. Japanese authorities decided on foreign instructors and a four-year course. The curriculum included physics, chemistry, zoölogy, botany, anatomy, physiology, animal husbandry, pathology, surgery, medicine, cattle breeding, sanitation, and veterinary jurisprudence. For student practice, a free clinic was opened for cows, horses, and dogs.

In 1875, the army veterinary section, which had been attached to the army medical department, became an independent unit directly controlled by the army ministry. In 1879, a full-time army veterinary general was appointed. Formerly, two army surgeon generals occupied this position as an additional function to their other duties.

Prior to Dr. Ango's return to France at the expiration of his contract, a plan to send students of veterinary medicine to France on scholarships was consummated. In 1880, one student was sent to a veterinary college in France for four years' study and then to Germany for postgraduate training. This was the first student to study abroad.

As a forerunner of its kind, in Septem-

ber, 1881, nine veterinary graduates established a private school in the compound of Temple Gokokuji, Tokyo, occupying a part of the temple building; but in the winter, when dissection of horses had drawn a complaint from the temple authorities, this type of instruction was abandoned. (The winters are mild in Tokyo.) The school was moved near an army stable; this gave the students ample facilities for practice.

Veterinarians Licensed.—In August, 1885, and for the first time, a system of licensing was established. The gist was: "A veterinary practitioner shall have a license by examination. Accredited public and private veterinary school graduates may get a license without examination. In veterinary-deficient districts, by the governor's request, nonlicense holders may have a temporary license based on their past career."

From the year 1886 through the late 1890's, the veterinary profession experienced the pains associated with the birth and organization of such professions. In this same year, the first veterinary license examination was given. Of the 263 applicants, licenses were issued to 100 graduates.

Japan, in the latter part of the nineteenth century, began to recognize the necessity of a veterinary profession, and established animal quarantine stations for the control of infectious and contagious diseases.

In August, 1899, Assistant Professor Tokishige, of the Tokyo Agricultural College, was asked to represent Japan at the Seventh International Veterinary Congress in Baden-Baden. This was Japan's first participation in veterinary activities of a global nature.

Twentieth Century Changes.—During the next ten years, many changes took place in agricultural practices of Japan. Existing regulations and quarantine acts were revised and more stringent sections were applied. The manufacture of biological products was developing. Progress was made until the Russo-Japanese War, when great concentrations of animals were shifted, occasioned by military necessities; consequently, areas that had been relatively free of disease, developed maladies of epizoötic proportions. To counteract these conditions, the Japanese government enlarged the Nishigahara Veterinary Research Institute. From this laboratory "there was developed a method and practical application of immunization against cattle plague with the gall of diseased cattle."

In 1910, after the annexation of Korea, the "rinderpest serum manufacturing establishment" in Tokyo was moved to Fusan, Korea, where, for the next ten years, research progressed toward the development of a lapinized vaccine.

In 1921, the Comparative Pathology Society and the Japan Veterinarian Society were established, a veterinary periodical was published, and the first general meeting of veterinarians was held.

Just when Japan had thought itself competent to handle diseases of epizoötic proportions, a condition known as "cow's contagious lung pleurisy" broke out. The first cases appeared near Osaka city, and within six weeks the disease had spread to eight other prefectures. Unable to suppress the outbreak, the Japanese livestock authorities ordered the slaughter of all infected and contact animals. Approximately 1,000 head were destroyed; indemnity amounting to 600,000 yen was paid.

During September, 1926, the Japan Invention Society publicly commended three men in veterinary medicine. The awards were presented to Dr. Kahizaki, director of veterinary medicine, Agricultural Ministry, for developing "cow plague preventive vaccine"; Dr. Hasui, director of veterinary affairs, for his contributions to the poultry industry,—newborn chicken sex discrimination; and Dr. Nakamura, director of agriculture, for his research on serum for fowl diphtheria.

In April, 1927, a national veterinary society was proposed to the Diet by local societies, and a year later was approved by the Agricultural Ministry. During the following year, the first general meeting of the Japan Veterinary Society was held.

MODERN JAPANESE VETERINARY SCIENCE

Thus we come to the modern day of veterinary science in Japan. But wars and incidents such as the "Manchurian Affair and the Japanese Asiatic Co-prosperity Act" have served to delay the adoption of scientific methods, such as are practiced in the United States today.

The Japanese production and control of biological and pharmaceutical products, and antibiotic agents have a taint of quackery which is difficult to dismiss.

Research and field investigation work

have been emphasized for a number of years. Unfortunately, however, a majority of published material would indicate that their field of endeavor was one of confirmation rather than originality. There are few exceptions.

With the entry of the Allied Occupation Forces into Japan, and the participation by Army veterinarians in the program of rehabilitation, it is felt that the Japanese future in veterinary medicine will be more secure, and that they, as scientists, may contribute toward the advancement of this science.

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SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Episiotomy in Veterinary Obstetrics

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THE EPISIOTOMY is an almost routine procedure in human obstetrics and has, in the hands of the medical practitioners, greatly facilitated the passage of the fetus through the birth canal. It not only prevents laceration of the vulva, perineum, and unnecessary pressure upon the fetus, but also allows an easy delivery with greater ease of manipulation, or use of forceps, as the case may be.

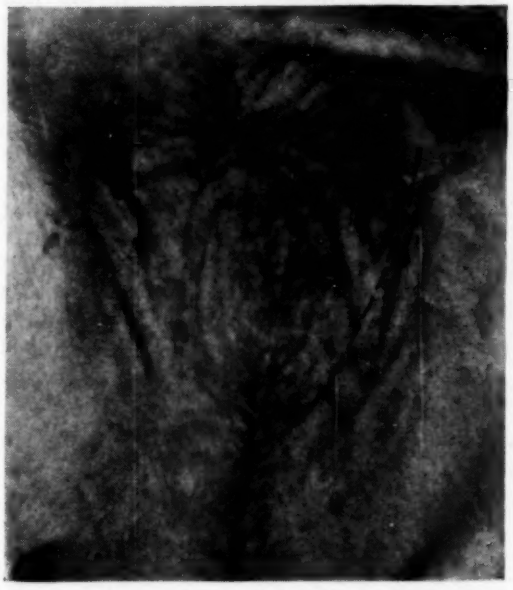


Fig. 1—The perineal region indicating (dotted line) the line of incision for an episiotomy.

The necessity for an episiotomy occurs frequently in the case of a first-calf heifer with an oversized fetus, perhaps most commonly of the beef type. This type of dystocia is often handled by traction and slight rotation. In many cases, we find that there is ample clearance in the pelvic canal and vagina for passage of the calf, but the constriction occurs at the vulva. As a result, when traction is applied the tissues of the vulva are lacerated and severely bruised, and, as a common sequela, a necrotic vulvitis and vaginitis occurs. Not only does an episiotomy facilitate the passage of the calf by permitting greater dilatation without rupture of any tissue during delivery, but also, in many cases where manipulation of the fetus or embryotomy is necessary, it allows the veterinarian more space for his arms and obstetrical instruments.

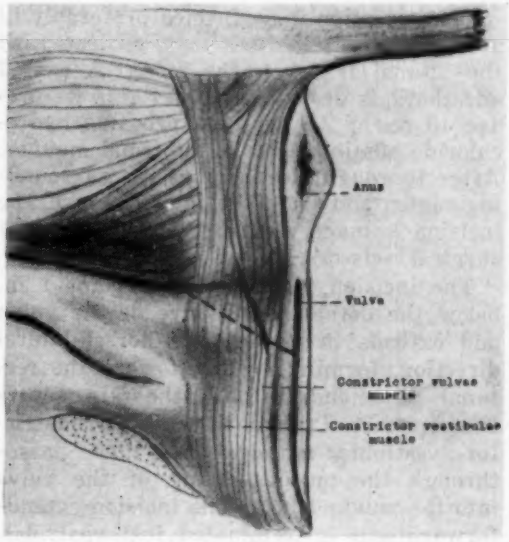


Fig. 2—Lateral view of perineal region, dotted line indicates line of incision.

The operation which I will describe is known in human obstetrics as the mediolateral incision. There is also a median

I am indebted to C. S. Brooks, D.V.M., Hollister, Calif., for my practical knowledge of this operation.

episiotomy which is described in human obstetrics and has also been used in veterinary medicine, but in our work the mediolateral incision has given better results. The technique of the median episiotomy is simply to make an incision from the dorsal commissure of the vulva upward to the anus, taking care not to sever the sphincter ani muscles. A disadvantage of the median incision is that, in some cases when pressure is brought to bear upon the parts during the delivery, the anal sphincter is easily torn which is a very disagreeable sequel to deal with. We also found that this incision does not give as great dilatation of the vulvar orifice as is always required, while the mediolateral incision does give a great deal more dilatation of the orifice.

PROCEDURE

The operation is performed preferably in a standing position, but may be done with the animal lying on the side. A caudal anesthetic is desirable and for this we prefer 10 cc. of 2.5 per cent procaine hydrochloride administered in the usual manner. After thorough cleansing of the surrounding region and examination of the case, the incision is made with a scalpel or straight surgical scissors.

The incision is started at a point 1 in. below the dorsal commissure of the vulva and extends in an anterior dorsal lateral direction, forming an arc, toward the rectum.[1] It extends through the skin, severs the constrictor vulvar muscle, the constrictor vestibule muscle, and then passes through the mucous lining of the vulva into the vulvar tract. The incision extends forward and is terminated just ventrolateral to the anus. Great care must be taken not to sever the muscles of the anus and rectum. In cases where more room is desired through this region, the incision may be extended further forward, lateral to the rectum, but again care must be taken not to sever the rectal muscles. As the fetus passes through, the rectum and vulva act as an unattached flap which is forced to the side, forming a large opening. In making the incision, a branch of the internal pudic artery or vein may be severed. The hemorrhage may be controlled either by applying a hemostat for a short time to the exposed ends of the vessel or applying a permanent ligature. We have found that this hemorrhage is not serious, and, after passage of the calf, usually stops by itself.

The closure of the incision is made by applying either interrupted or continuous sutures of size 3 medium chromic catgut with size 4 full curve needle. The sutures are started at the superior end of the incision passing downward through the skin, mucous membrane of the vulva, across the vulvar cavity, upward through the mucous membrane, and out through the skin of the opposite side. The tissues are pulled into apposition and the suture tied. From here on, the opening may be closed by continuing these sutures downward until the tissues are apposed, then tying the end suture. One may also place interrupted sutures which appose the tissues in the same manner. In suturing these tissues, care should be taken to bring the sides of the incision into normal position, and the sutures should not be drawn too tightly as some swelling may occur.

This operation has been successfully used for the past ten years in many obstetric cases. It has been a great aid in facilitating easy delivery, and has avoided severe lacerations and bruises. In addition to use on the cow, the episiotomy has proved equally successful on the bitch and sow in our practice.

[1]Sisson, Septimus, and Grossman, James: The Anatomy of the Domestic Animal, 3rd Ed. W. B. Saunders Co. (1938).

Morphine in Shock

Morphine, given in doses of 2 mg./kg. to normal dogs, produced excitement followed by sharp decreases of respiratory and heart rate, oxygen consumption, blood pressure, venous oxygen, arterial CO_2, and cardiac output. In the same dose in hemorrhagic shock, there was a momentary fall and then a rise in blood pressure, concurrent with increased venous oxygen, arterial CO_2, and cardiac output. In traumatic shock, the trials showed that morphine in that dose caused a further drop in blood pressure, oxygen consumption, and cardiac output. The two trials were made on 10 dogs and 9 dogs, respectively, by Reed, Powers, and Gregersen of Columbia University (*Biol. Abstr.*, Sec. B., 1947: 2387). They show the important fact that morphine gave a favorable response in shock

from blood loss while it further depressed the victim of traumatic shock. The conclusion reached is that the suffering dog hastily brought in after an accident should not be given morphine, but it would not be harmed if suffering from blood loss only.

Vagatonine in Feline Anesthesia

The fatal accidents commonly occurring in cats anesthetized with ether or chloroform can be largely prevented by vagatonine—a purified hormone of the pancreas unrelated to insulin. Vagatonine is an amorphous white powder, water soluble and slightly hygroscopic. When injected intraperitoneally at the rate of 5 mg./kg. (1% solution), it prevents syncope by stimulating the parasympathetic system and, in so doing, importantly reduces the toxicity of these anesthetics, but does not make them absolutely foolproof in profound anesthesia.—*From Bulletin de l'Académie Vétérnaire de France, April, 1948.*

Chickens Tolerate Anesthesia

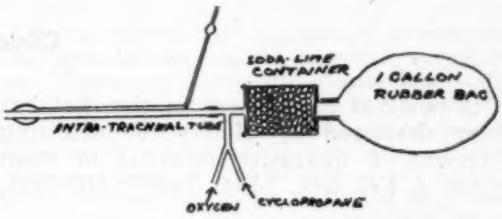
Dr. M. A. Northrup, of San Francisco, writes from London, England: "The AVMA JOURNAL, vol. 112, March, 1948, p. 226, has misquoted me." In the discussion of the paper by Dr. W. A. Young, the stenographic report was used to prepare the JOURNAL item. But regardless of where the error first entered the picture, line 7 (first column), p. 226 should read: "Chickens are tolerant to nembutal and ether."

Dr. Northrup's letter contains this paragraph: "One of the laity's most severe and justifiable criticisms of our profession is that certain members have been known to inflict unnecessary cruelty upon animals. As such, they are to be classified as cowards and sadists. The anesthetic armamentarium of the modern veterinarian is so good that animal pain is obsolete."

Impaired Reproduction in Show Animals.—In the fitting of animals for show purposes, physical excesses are unavoidable. As long as the measuring stick for animal perfection remains as it is, and animals are given too much grain and subjected to the rigors of show fitting, their chance to live and reproduce to the best of their inherent ability will be hampered and impaired. Moreover, liver damage in highly fitted animals is tremendous.—*Dr. H. E. Kingman, Sr., in Am. Hereford J., Feb. 1, 1948.*

Cyclopropane Anesthesia

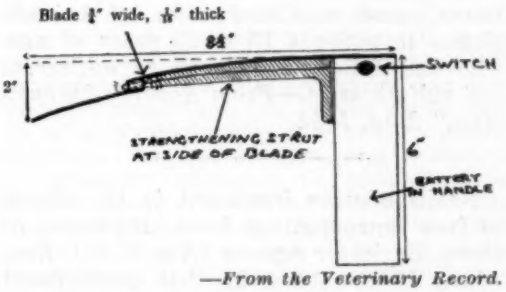
Cyclopropane is a gas that offers comparative freedom from toxic effects on heart, lungs, kidneys, and liver, and though



—From the Veterinary Record.

Fig. 1—Assembly of intratracheal tube, soda lime absorber, and anesthetic bag.

it is expensive and—more important—explosive when mixed with oxygen, its required administration in a completely closed circuit utilizes a small amount to fullest advantage, thus effecting economy, and largely rules out the inherent dangers of explosion.



—From the Veterinary Record.

Fig. 2—The laryngoscope.

The author warns that the dose of nembutal should be the absolute minimum for permitting intubation, and he stresses the need for the type of laryngoscope depicted. The equipment is shown herewith.—*Vet. Rec.*

In some heavy breeds, particularly the White Wyandottes, the fluff around the vent is heavy and may interfere with mating. Clipping the fluff may improve fertility.—*Poul. Tribune, March, 1948.*

The fertility of eggs usually begins to decline about one week after males are removed from the flock.

CLINICAL DATA

Clinical Notes

A modified complement fixation test has been developed by Morris for detecting carriers of ulcerative enteritis in quail (*Am. J. Vet. Res.*, (Jan., 1948): 102-103).

Bankowski found (*Am. J. Vet. Res.*, (Jan., 1948): 85-91) that individual birds varied widely in rate of absorption and the elimination of sulfaguanidine, and that there appeared to be a tendency for the drug to concentrate in the cecum.

Streptomycin in Bubonic Plague.—Streptomycin in 0.125-Gm. doses every three hours for seventy-two to ninety-six hours cured moribund cases of bubonic plague in patients 13 to 25 years of age, who had failed to respond to antiserum and sulfathiazole.—*From Abbott's "What's New," May, 1948.*

Snails may be important in the efforts to free range pasture from lungworms of sheep. Gerichter reports (*Am. J. Vet. Res.*, (Jan., 1948): 109-112) that development of the Metastrongylus larvae in snails is retarded by cold weather. Infection, even by numerous larvae, apparently does not harm the snail host.

Nematode Infection in Sheep.—Infections of range lambs with gastrointestinal nematodes are acquired principally during May and June, when the heaviest rainfall generally occurs. The range then becomes practically free of infective larvae of Haemonchus and Trichostrongylus after mid-July. During the ensuing dry period, the eggs were killed within ten days' exposure on the ranges studied by Seghetti (*Am. J. Vet. Res.*, (Jan., 1948): 52-60). Reservoirs were found to be of no importance as a direct source of infection in range sheep.

Linseed meal is toxic because it produces a deficiency of, or renders unavailable, one or more of the B vitamins.—*Poultry Sci., March, 1948.*

Volvulus and anal fissure are conditions known to be associated with either increased peristalsis or spasticity of part of the intestinal tract.

Beaudette and his coworkers found that a mixture of penicillin and streptomycin may be used to provide bacteriologic sterilization of samples from which viruses are to be isolated (*Am. J. Vet. Res.*, (Jan., 1948): 97-101).

Anthelmintic treatment of foals at weaning time is inadvisable, because the most dangerous species of internal parasites have not yet reached maturity and are not accessible to the action of drugs in the intestine.—*J. Comp. Path. and Therapeutics, April, 1948.*

Rhode Island Red pullets fed sulfaquinoxaline (0.05%) in the mash by Delaplane and Milliff (*Am. J. Vet. Res.*, (Jan., 1948): 92-96) developed symptoms of toxicity (weakness and apparent anemia) and died. The lesions were characterized by greyish white nodules in the spleen, liver, kidney, heart, and lungs. Hemorrhages were seen in most birds beneath the skin of the legs and in the combs.

The symptoms generally associated with parasitism by *Oesophagostomum radiatum*, the nodular worm, develop during the prepatent period. Following maturing of the larvae, the general condition improves. Even so, removal of adult parasites is extremely desirable because it helps to reduce the egg and larval population of the premises, according to Mayhew (*Am. J. Vet. Res.*, (Jan., 1948): 30-34).

Parasitology

Report of the Committee on Parasitology

Following the establishment of the Standing Committee on Parasitology in 1947, a definite program of duties was agreed upon by the members. This program was designed to survey the field of practical veterinary parasitology in North America and to bring into focus the main problems that will be met in practice. Modern trends in veterinary parasitology, in common with the trends in other branches of our profession, necessitate the clarification of the etiology of common disease processes. Also, the rapid advances in the field of chemotherapy have made necessary a reëxamination of the drugs available for use against parasitic diseases.

The committee raised four questions:

1) What are the main parasitic diseases of livestock in various parts of the continent?

2) In view of the fact that, in general, animal parasites do not cause clinical disease when a normal host-parasite balance is established, what factors are responsible for the onset of clinical parasitic disease?

3) What is the rôle of insecticidal, anthelmintic, or protozoastatic chemotherapy in any disease?

4) What chemotherapeutic agents can be approved, or tentatively approved, for practical use by veterinarians at the present time?

In attempting to prepare a report on these problems it became evident that only a start could be made during the first year's work of the Standing Committee. It was felt (and hoped) that the preliminary report would stimulate discussion, and would bring forth suggestions from colleagues in regard to the future program of work. Thus, it was decided that this first report would be made in two parts, the first to name and briefly define the parasitic diseases considered by the committee to be of greatest economic importance, and the second to list the chemotherapeutic agents that are, or probably will be, most useful to the veterinarian.

One further explanation is necessary. The parasitic diseases of dogs, cats, and furbearing animals could not be considered in this first report due to obvious limits of time, and to the fact that there is less uncertainty in regard to parasitic diseases of these animals than there is in the disease problems of food-producing and food animals.

Part 1

It was agreed that a tendency to consider the parasite alone as the important factor in the etiology of a parasitic disease might not be in the best interests of veterinary practice, as a clinical form of a parasitic disease is often brought about by a complexity of conditions. Hence, it was decided to list the six most common conditions associated with animal parasites as they occur in each farm animal in various regions of the continent. From this list, it was hoped that a survey of opinion would help to clarify the etiology of each and lead to more practical research and more efficient control measures by veterinarians. However, the marked differences between regions, the differences in opinions in regard to the clinical significance of some conditions, and the underlying factors concerned with their occurrence made the task difficult. Nevertheless, a list was prepared by assigning points to each disease. If a committee member, after consultation with coworkers, listed a disease first in order of economic importance, that disease received 6 points; if listed sixth it received 1 point, and so on. It is realized that this does not take into account the fact that certain diseases important in New Mexico may be of no significance, or may even be absent, in Ohio or Canada; however, those of obvious or apparent importance in certain regions only are listed at the end of each section. The very fact that one parasitic disease is of economic importance in New York, and of no significance in adjoining territories, even though the parasites are present, is of scientific interest and indicates a need for further investigation of complicating factors.

Such points, raised by this preliminary survey, will be considered in subsequent reports.

The list, as assembled during this first year, and which is subject to additions and corrections, follows.

Horses

1) *Strongylosis.*—This condition is caused primarily by the nematodes Strongylus spp. and various small strongyles. It is characterized by lack of condition, diarrhea, and anemia. It is usually associated with permanent horse pastures. Factors probably predisposing to the clinical disease are not clear, but it is suggested that *Strongylus vulgaris* is a primary pathogen and might predispose to massive infections with other large and small strongyles. Why strongylosis is more serious in the dry

western provinces of Canada than in the eastern provinces, where summer rainfall is higher, is not understood.

Improved sanitation, pasture rotation, and routine use of anthelmintics (phenothiazine or oil of chenopodium) are recommended.

2) *Gastric Myiasis.*—This is caused by the larvae of Gastrophilus spp. (bots). No predisposing cause is evident; apparently it relies only on a high bot fly population. In spite of uncertainty regarding the pathology of the disease, the committee's votes place this condition second only to strongylosis.

The use of carbon disulfide to alleviate the condition and reduce fly populations is advised.

3) *Ascariasis.*—This disease is caused by *Parascaris equorum.* The onset of the disease is largely blamed on poor sanitation; however, there is one suggestion that too early weaning and malnutrition (avitaminoses and hypoproteinemia) are important predisposing factors.

Correction of poor husbandry and anthelmintic medication with carbon disulfide are advised.

4) *Pediculosis.*—Pediculosis is caused particularly by the louse *Haematopinus asini,* is considered important because it occurs commonly, and is characterized by loss of condition and rough coat. Veterinarians should suspect a predisposing factor such as malnutrition or an underlying pathologic condition when heavy infestations of certain individuals are seen.

The use of insecticides founded on rotenone or DDT are advised as routine practice.

5) *Oxyuriasis.*—The pinworm, *Oxyuris equi,* causes oxyuriasis. Poor stable hygiene is the only factor now recognized as being responsible for the onset of the condition. While it is not a true clinical disease, the continual irritation and consequent mutilation is considered important.

Control entails improvement of sanitary measures in the stable and, possibly, medication with oil of chenopodium.

6) *Cutaneous Myiasis.*—This condition is caused by screw-worms (Cochliomyia sp.) and is a southern problem. Its onset follows tick bites, etc. Smear 62 is recommended.

Other Conditions.—Listed by individual members as being among the six most important parasitic diseases are hornfly injury (N. M.), tabaniasis (Ohio), tick injury (N. M.), habronemiasis (Texas), teniasis (N. Y.), and gastric trichostrongylosis (N. Y.).

CATTLE

1) *Myiasis and Fly Damage.*—This condition is due to Hypoderma spp. (warble flies). It was agreed upon as an important cause of loss, although it is difficult to describe as a disease entity. Young cattle are very susceptible, and a moderate or even low population of flies will cause considerable economic loss. Control by area treatments of cattle with rotenone should be supported.

2) *Trichostrongylidosis or Verminous Gastroenteritis.*—Caused by Haemonchus, Ostertagia, Trichostrongylus, etc., this condition, at the present stage of knowledge, is not easily subdivided into specific diseases. The lack of unanimity in regard to the occurrence of this disease suggests that predisposing causes are not well understood. The use of phenothiazine as an anthelmintic and the rotation of pastures are advised in areas where it is definitely diagnosed.

3) *Coccidiosis.*—Caused by Eimeria spp., coccidiosis apparently occurs only under conditions of poor husbandry, as factors such as excessive exposure, malnutrition, severe chilling, etc., appear to influence the onset of the acute form. No specific treatment was agreed upon.

4) *Pediculosis.*—Caused by Haematopinus spp. and Bovicola sp., this disease is considered important because of loss of condition in affected animals. While it occurs in normal animals, severe infestations should elicit attention to predisposing weaknesses. DDT sprays and rotenone in dusts or sprays are recommended.

5) *Lungworm Disease or Verminous Bronchitis.*—This is caused by heavy infections with *Dictyocaulus viviparus.* It is important in certain regions only and is correlated with damp pastures. Sanitary measures and the removal of stock away from contaminated pastures to drier ground are recommended.

6) *Mange.*—Caused by Sarcoptes and/or Chorioptes, mange is important in the northern states in winter, and as a herd problem brought on by lack of attention to early cases and contacts. Lime-sulfur sprays are recommended. Benzenehexachloride might be used on beef cattle but not in dairy barns.

Other diseases considered were trichomoniasis, anaplasmosis, black fly damage, screw-worm damage, tick infestation, hornfly damage, and tabaniasis.

HOGS

1) *Ascariasis.*—Caused by *Ascaris lumbricoides,* infected animals are predisposed to clinical ascariasis by nutritional deficiencies (avitaminoses and anemia) in the presence of poor sanitation. Anthelmintic medication with oil of chenopolium or sodium fluoride, after definite diagnosis, is indicated. Improved nutrition of pregnant sows and weanlings should accompany better sanitary measures.

2) *Pediculosis.*—This disease is caused by the louse *Haematopinus suis.* It is considered second in importance because of widespread occurrence and loss of condition in infested hogs. No predisposing factor is suggested, but it is usually associated with poor husbandry. Con-

trol by use of DDT, oils, or thiocyanates in mineral oil are recommended.

3) *Mange or Scabies.*—Caused by Sarcoptes sp. or Demodex sp., mange or scabies occurs as a herd problem only under insanitary conditions. Lime-sulfur dips are the treatment of choice. Benzenehexachloride (BHC) may be used under certain circumstances, but more data are needed.

4) *Lungworm Disease or Verminous Bronchitis.*—This is caused by Metastrongylus spp. Nutritional deficiencies apparently predispose to the disease. No medicinal treatment is recommended. Ringing hogs, rotation of pastures, and strict sanitation are standard measures, but should be supplemented by improved nutrition.

5) *Thorny-Headed Worm Infection.*—This condition is caused by *Macracanthorhynchus hirudinaceus* and may occur whenever hogs have access to June bug, and related beetle, larvae; it is more common wherever hogs have free range. No curative treatment is recommended; prevent losses by confining animals to pens or small lots.

6) The disease sixth in importance could not be chosen, as stephanuriasis, verminous gastritis, oesophagostomiasis, coccidiosis, and tick infestation each received mention by one member only.

SHEEP

1) *Trichostrongylosis.* — This disease is caused by Trichostrongylus spp. Sheep are apparently predisposed by some forms of dietary deficiency. Control measures should include anthelmintic medication; phenothiazine and cunic are recommended. However, improved feed and correction of mineral deficiencies are necessary.

2) *Nodular Disease.*—Caused by *Oesophagostomum columbianum*, nodular disease is important in high rainfall areas in the east. Predisposing factor is probably the host species, as the parasite is always pathogenic in sheep. Anthelmintic medication with phenothiazine is important. Use pasture rotation, phenothiazine, and salt licks if necessary. Dosing before the flock can contaminate the pasture is important.

3) *Haemonchosis or Summer Anemia.*—This condition is caused by *Hemonchus contortus.* Sheep are extremely susceptible, but control measures have reduced the importance of this disease in North America. Anthelmintic medication and pasture change, where necessary, are efficient. Phenothiazine and cunic are recommended.

4) *Nosefly Damage (“Grub-in-the-Head”).*—Nosefly damage is caused by *Oestrus ovis.* The committee suggests that pressure irrigation of each nasal passage with 1 oz. of 3 per cent saponified cresol, in late fall or early winter, should be considered (*see J.A.V.M.A., 97*:571-575).

5) *Lungworm Disease or Verminous Bronchitis.*—Caused by *Dictyocaulus filaria*, and possibly complicated by *Muellerius capillaris*, lungworm disease occurs on wet pastures, and sheep may be predisposed by other parasitic diseases or nutritional deficiencies. Improved pasture and feed supplements are recommended.

6) *Ked Infestation.*—This condition is caused by *Melophagus ovinus.* Infestations are built up as a result of neglect. Routine dipping with rotenone-bearing powders in suspension or with DDT preparations is effective. BHC might be used.

Other diseases receiving mention by one or more members were chabertiasis, teniasis, blood filariasis, cutaneous myiasis, hookworm disease, and wool maggot infestation. It is recognized, of course, that fascioliasis is still a major problem in the far western states.

CHICKENS

1) *Cecal Coccidiosis.*—This is caused by *Eimeria tenella.* Modern methods of brooding chicks render them highly susceptible. Control by sanitation and by coccidiostatic sulfonamides (sulfamethazine, sulfamerazine, and possibly sulfaquinoxaline) is recommended.

2) *Intestinal Coccidiosis.*—Caused by Eimeria spp., this condition occurs in older birds, particularly under insanitary conditions. Drug treatment is not at present recommended; improved sanitation is essential.

3) *Pediculosis.*—Caused by the lice Eomenacanthus sp., Lipeurus sp., Goniocotes sp., in particular, this disease might be fatal to young birds; heavy infestations follow predisposition by other conditions. Derris, nicotine sulfate, and possibly BHC, are recommended.

4) *Ascaridiasis or Roundworm Disease.*—Caused by *Ascaridia galli*, roundworm disease occurs when nutritional deficiencies are combined with insanitary conditions. Control measures include anthelmintic medication with nicotine products and improved sanitation.

5) *Teniasis or Tapeworm Infection*—Teniasis is caused by Choanotenia sp., Raillietina spp., and Davainea sp. Young birds, suffering from malnutrition or other diseases and having access to arthropod intermediaries, are chiefly affected. Improved sanitation is the basis of control, but kamala or periods of starvation might be used as additional measures.

6) *Acariasis or Mite Infestation.*—Caused by Liponyssus sp., Dermanyssus sp., and Argus sp. (South), infestations build up quickly and affect otherwise healthy birds. The use of carbolineum and creosote in houses is recom-

mended. Nicotine sulfate on perches is advised for the mites.

Other diseases important in certain regions are capillariasis, syngamiasis or "gapes," infestations of stick-tight fleas, and Mexican chicken bugs.

TURKEYS

1) *Enterohepatitis or "Blackhead."*—This condition is caused by *Histomonas meleagridis*. The turkey is highly susceptible in contrast to the resistant chicken. Sanitary measures to avoid contact with chickens or any source of cecal worms is fundamental for control, as no medicinal treatment is recognized.

2) *Pediculosis.*—Caused by Goniodes sp. and Lipeurus sp., this disease is responsible for losses in all regions. Insecticides such as DDT, nicotine sulfate, and possibly BHC are recommended.

3) *Coccidiosis.*—Caused by Eimeria spp., coccidiosis occurs under insanitary conditions, but details regarding the reasons for susceptibility are lacking. Improved sanitation is the only definite recommendation.

4) *Teniasis.*—Caused by Choanotenia sp., teniasis occurs when flies are not controlled, and other insanitary conditions are present. Improvement in husbandry is fundamental.

5) *Leucocytozoön Disease.*—This disease is caused by *Leucocytozoön smithi*. The turkey may be an abnormal, and thus a highly susceptible, host. No chemotherapeutic measure is yet available. Control of black flies might be possible in some regions.

6) The sixth position could not be assigned as suggestions for trichomoniasis, hexamitiasis, fowl tick infestation, syngamiasis, and ascaridiasis all received similar weight of opinion from various regions.

This first report is submitted with a plea for constructive criticism and suggestions from members of the American Veterinary Medical Association. It is felt that the apparent differences of opinion might stimulate more study and observations on certain diseases, and if this result does comes to pass then the committee will feel well repaid.

Part 2

TABLE 1—A Preliminary List of Insecticidal Drugs or Chemicals Considered by the Committee on Parasitology

Chemical	Uses	Committee's judgment
Benzene hexachloride (BHC)	Lice—poultry	B B C
	Lice—cattle	B B C
	Lice—hogs	B B C
	Lice—other stock	B B C
	Spinose ear ticks	A
	Sheep keds	A C C
	Mexican chicken bugs	A
	Bedbugs	A
	Stick-tight fleas	A
	Fever ticks	B
	Winter ticks	B B
	Scabies mites	B B C
	Poultry mites	B C
	Ox warbles	D D D
	Ear mites	A
Benzyl benzoate	*Demodex canis*	A A A
	Sarcoptic mange—dogs	A A A
Dichloro-diphenyl-trichlorethane (DDT)	Sheep keds	A A A A
	Houseflies	A A A A A
	Hornflies	A A A A A
	Winter ticks	A B
	Bedbugs	A A
	Lice—farm animals	A A
	Lice—dogs	C
	Lice—cats	D
	Mexican chicken bugs	A
	Fever ticks	B
	Poultry mites	C
	Mange mites	D D D
	Fleas—dogs	A A
	Fleas—cats	D
Derris, cubé & other rotenone-bearing substances	Ox warbles	A A A A A
	Sheep keds	A A A A
	Lice—all animals	A A A A
	Fleas—all animals	A A A
	Demodex mites	A
	Ear mites	A
Creosote oils & carbolineum	Poultry mites	A A D
	Fowl ticks	A
Lime—sulfur solution	Scabies mites—all stock	A A A A A
Arsenical solution	Fever ticks	A
Nicotine sulfate	Poultry lice	A A A
	Poultry mites	A A A
Sulfur	Ectoparasites of livestock	D D
Smear 82	Screw-worms	A
Stock 1029	Spinose ear ticks	A
Formula M.S.	Fleece worms	A

Table 1 was assembled from the opinions and judgments of the committee members. A=approval. B=tentative approval pending more data. C=reserved judgment. D=not approved.

(Continued on opposite page.)

TABLE 2—A Preliminary List of Anthelmintic Drugs or Chemicals Considered by the Committee on Parasitology

Chemical	Uses	Committee's judgment
Antimony compound (Fuadin)	Heartworms—dogs	A A A A
	Blood filarids—sheep	A
Arecoline hydrobromide	Tapeworms—dogs	A A
	Parasites—herbivores	D
Barium antimonyl tartrate	Gapeworms—fowl	A A A
Carbon disulfide	Bots & ascarids—horses	A A A A
	Stomach worms—Swine	A
	Stomach worms—horses	A
Carbon tetrachloride	Nematodes—all stock	D D
	Liver fluke—sheep	A
	?? horses & dogs	B
Copper Sulfate	Haemonchus—ruminants	A A
Di-Phenthane	Tapeworms (not dipylidium)—dogs	C
	Tapeworms (dipylidium)—dogs	D
Hexachlorethane	Liver flukes—sheep & cattle	A A A
Hexylresorcinal	Ascarids—dogs	A
Kamala	Tapeworms—poultry	A B C D
Lead arsenate	Tapeworms (Moniezia)—sheep	A C C
Male fern	Tapeworms—dogs	B D D
Nemural	Tapeworms—dogs	A A A
	Tapeworms—cats	A
N-butyl chloride	Whipworms—dogs	A A
	Hookworms—dogs	A A A
	Ascarids—dogs	A A A
Nicotine sulfate	Roundworms—fowl	A A A
Nicotine sulfate (combined with $CuSO_4$)	Stomach worms—ruminants	A A A
Oil of chenopodium	Ascarids—swine	A A B
	Ascarids—dogs	A A B
	Large & small strongyles—horses	A A A B
Phenothiazine	Large & small strongyles—horses	A A A A
	Trichostrongyloid nematodes—ruminants	A A A A
	Nodular worms—sheep and cattle	A A A A
	Chabertia—sheep	A
	Cecal worms—poultry	A A
	Ascarids—swine	B D
Santonin	Ascarids—dogs & cats	C C C
Sodium fluoride	Ascarids—swine	A C C
Tartar emetic	Strongyles—horses	C C D
	Blood filarids—sheep	A
Tetrachlorethylene	Hookworms—dogs	A A A A
	Ascarids—dogs	A A
	Hookworms—sheep	A A
	Trichostrongylosis—sheep & cattle	A A B
	Hemonchosis—sheep	A A
Turpentine	Tapeworms—horses	A
	Any purpose	D

Table 2 was assembled from the opinions and judgments of the committee members. A=approval. B=tentative approval pending more data. C=reserved judgment. D=not approved.

TABLE 3—A Preliminary List of Protozoastatic Drugs or Chemicals Considered by the Committee on Parasitology

Chemical	Uses	Committee's judgment
Atabrine	Giardia—dogs	C
Sulfamerazine	Cecal coccidiosis—chickens	A A A B
Sulfamethazine	Cecal coccidiosis—chickens	A A B
Sulfaquinoxaline	Cecal coccidiosis—chickens	A C
Sulfaguanidine	Cecal coccidiosis—chickens	B D
	Intestinal coccidiosis—chickens	C
Sulfathalidine	Coccidiosis—dogs & cats	A C C

Table 3 was assembled from the opinions and judgments of the committee members. A=approval. B=tentative approval pending more data. C=reserved judgment. D=not approved.

Committee on Parasitology

W. E. SWALES, *Chairman*

D. W. BAKER R. E. REBRASSIER

H. E. KEMPER R. D. TURK

The Blood Level Response of Horses to Administration of Penicillin in Oil and Wax

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BECAUSE of the rapid absorption and excretion of penicillin when administered parenterally in aqueous solutions, it has been difficult for the veterinary practitioner to use this antibiotic agent in treatment of systemic diseases. Numerous means of delaying absorption and excretion have been proposed. A previously reported investigation on delaying absorption of aqueous material in horses indicated that vasoconstrictors in saline solutions, concentrated sugar solutions, gelatin solutions, and vasoconstrictors in solutions of gelatin, sucrose, and dextrose were ineffective in delaying absorption of penicillin.[1] A preparation of penicillin, 100,000 units/cc. in linseed oil, was found effective in delaying absorption, but proved too irritant to the tissues for clinical use.[1] Investigation of a water-in-oil-and-wax vehicle indicated that the preparation was of no value in delaying absorption following intramuscular injection in horses and sheep.[2]

The mixture of penicillin in beeswax and peanut oil, identified as the Romansky formula,[3, 4, 5] apparently is the most satisfactory preparation currently available for delaying absorption of penicillin following intramuscular injection. Maintenance of measurable concentrations in the serum for twelve to twenty-four hours or longer with single injections of various doses has been reported in human patients.

MATERIALS AND METHODS

Except for slight modification of the control series, the method used for determining the quantity of penicillin in the serum was the same as described in a previous report.[6] Blood samples were obtained from the jugular vein using sterile syringes. With doses of 500 units/lb., blood samples were obtained at quarter- and half-hour intervals and hourly thereafter for a number of trials. In others, bleedings were made only at hourly intervals.

For doses of 1,000, 2,000, and 4,000 units/lb., blood samples were obtained at intervals of one, two, or three hours throughout the test period. Doses in units per pound of body weight were measured as accurately as possible in glass syringes of 1.0, 2.0, 5.0 or 10.0 cc. capacity depending on the volume of material to be injected. Intramuscular injections were made into the long head of the triceps, the anterior deep pectorals, and the muscles of the neck. A number of the horses receiving doses of 500 units/lb. were patients receiving penicillin therapy. The doses of 1,000, 2,000, and 4,000 units/lb. were all administered to normal animals. The entire volume of each dose was injected at one site.

The penicillin used in this investigation was labelled "penicillin in oil and wax" and contained 300,000 units/cc.

RESULTS

With doses of 500 units/lb. of body weight, the absorption of penicillin was definitely delayed as shown by zero levels at the fifteen and thirty minute periods. Further delay of absorption is shown by the lower serum concentrations and extended period of measurable blood level as compared with those obtainable from aqueous solutions of penicillin. Following intramuscular doses of 500 units/lb. in saline, the highest serum concentrations were obtained at twenty minutes following injection, and were reduced by one-half or one-fourth at one hour, with zero levels occurring at two and one-half to three hours.[6] In four of six determinations with the Romansky formula, using the same dosage, zero levels occurred at the fifteen minute period following injection, and zero levels were present at the thirty minute period in two of these. In two determinations of this group, there was a serum concentration of 0.02 unit/cc. at the fifteen minute period. With the twelve determinations using doses of 500 units/lb., zero levels were obtained at the sixth hour in two trials, the eighth hour in two trials,

The investigation reported in this paper is in connection with a project of the Kentucky Agricultural Experiment Station and is published by permission of the director.

The penicillin used was supplied by Merck and Company, Inc., Rahway, N. J.

the ninth hour in one trial, the tenth hour in three trials, the eleventh hour in one trial, and the twelfth hour in one trial. Two determinations were terminated at the seventh and eighth hours before zero levels occurred. The highest serum concentration obtained was 0.32 unit/cc., and this occurred in the trials in which zero levels occurred at the sixth and eighth hours. In the trials with zero levels occurring from the ninth to twelfth hours, the serum concentration did not exceed 0.08 to 0.16 unit/cc. In general, the serum level reached the highest point at the first or second hour and began receding at the fourth to sixth hour following injection. Detailed results of each dosage trial are given in table 1.

In four trials, the dose of 500 units/lb. was administered by subcutaneous injection (table 1). There appeared to be no advantage in height or duration of the blood level by this method. Localized, indurated nodules 2 to 4 cm. in diameter developed in the subcutaneous tissue at the site of injection and persisted for two to three months before being resorbed. Following this experience, all doses have been given by deep intramuscular injection without the occurrence of undesirable reactions.

In a series of six trials, using doses of 1,000 units/lb. of body weight with bleedings at two-hour intervals, zero levels occurred in two trials at the tenth hour, one at the twelfth hour and three at the fourteenth hour. Another series of four trials with hourly bleedings after the twelfth hour resulted in two zero levels for both the twelfth and thirteenth hours. The highest concentrations were present in the serum at the first and second hours and were receding at the sixth hour following injection in all cases. Equivalent doses of penicillin in saline solutions administered intramuscularly resulted in peak serum concentrations at twenty minutes following injection, with a reduction of one-half to one-fourth in one hour, and zero levels occurring at two-and-one-half to four hours.[6] At this dosage level, there appeared to be no correlation between the maximum concentration and the duration of a measurable level in the serum. Data for the individual determinations are given in table 2.

Doses of 2,000 units/lb. were administered to 8 animals (table 3). Blood samples

TABLE 1—Romansky Formula,* 500 Units Per Pound

Route	Weight (lb.)	Units in total dose	Units of penicillin per cc. of serum at specified intervals following injection in hours: .25	.50	1	2	3	4	5	6	7	8	9	10	11	12
SC	940	470,000	0.16	0.16	0.16	0.32	0.32	0.08	0.04	0.015	0.015	0.00	0.00	...	...	...
SC	760	380,000	0.00	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.02	0.015	0.015	...	...	...
SC	860	430,000	0.00	0.02	0.02	0.02	0.04	0.04	0.08	0.08	0.08	0.04	0.04	...	...	...
SC	860	430,000	0.00	0.02	0.02	0.02	0.04	0.04	0.04	0.04	0.04	0.02	0.02	...	...	...
IM	850	425,000	0.02	0.02	0.04	0.08	0.16	0.16	0.08	0.04	0.02	0.015	0.00	0.00	...	...
IM	760	380,000	0.00	0.04	0.08	0.16	0.16	0.08	0.04	0.02	0.015	0.015	0.015	0.00	...	...
IM	860	430,000	0.00	0.00	0.02	0.08	0.08	0.08	0.04	0.04	0.02	0.015	0.015	0.00	...	...
IM	860	430,000	0.00	0.00	0.02	0.02	0.02	0.02	0.04	0.04	0.02	0.02	0.015	0.00	...	...
IM	250	125,000	0.02	0.02	0.02	0.04	0.04	0.08	0.02	0.02	...	...	...	...	...	...
IM	700	350,000	0.02	0.02	0.04	0.04	0.04	0.04	0.02	0.02	0.02	...	...	...	...	...
IM	850	425,000	...	...	0.32	0.32	0.16	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IM	710	355,000	...	...	0.04	0.08	0.16	0.16	0.16	0.04	0.02	0.00	0.00	0.00	0.00	0.00
IM	1,010	505,000	...	...	0.015	0.02	0.04	0.08	0.08	0.08	0.04	0.04	0.02	0.015	0.00	0.00
IM	1,070	535,000	...	...	0.32	0.32	0.32	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IM	880	440,000	...	...	0.02	0.02	0.015	0.04	0.04	0.04	0.02	0.02	0.04	0.04	0.015	0.00
IM	1,070	535,000	...	...	0.16	0.32	0.32	0.16	0.04	0.02	0.015	0.00	0.00	0.00	0.00	0.00

*Merck and Company, Inc., Rahway, N. J.
SC=Subcutaneous. IM=Intramuscular.

were obtained at the first and third hours following injection and at three-hour intervals thereafter during a 24-hour test period. Considerable variation was found in both the duration of measurable blood level and in the concentration of penicillin in the serum. Zero levels occurred at the twelfth hour following injection in one trial, at the fifteenth hour in two, at the eighteenth hour in two, at the twenty-first hour in one, and at the twenty-fourth hour in one trial. In one determination, penicillin was present throughout the test period with a serum level of 0.02 unit at the 24-hour interval.

The differences in height of the serum levels throughout the test period indicates that there was considerable variation in the rate of absorption. Two horses with serum concentrations of 2.56 and 1.28 units/cc. of serum at the first hour following injection showed a gradual decline in serum level throughout the test period. Zero points occurred in these at the twelfth and fifteenth hours respectively. In the trial with a measurable level throughout the 24-hour period, the peak concentration was reached at the ninth hour with a gradual fall in concentration thereafter. For the trial in which the measurable level persisted for twenty-one hours, there were alternate rises in serum concentration with peaks of 0.32 unit/cc. at the third, the twelfth, and fifteenth hours. In general, the serum concentration did not rise above 0.64 unit/cc. of serum in the trials with a duration of fifteen hours or longer.

With doses of 4,000 units/lb., a measurable concentration of penicillin was maintained in the serum throughout the 24-hour test period in seven of eight trials. In the other, a penicillin level of 0.015 unit was present at twenty-one hours after injection. As indicated by height of the blood level, absorption was variable with peak concentrations being obtained on the first, third, and sixth hours following injection. Occasional variations of one dilution occurred between succeeding test periods from the first to the fifteenth hours, after which there was a general fall in the serum concentration. Except in two trials with a level of 0.08 unit/cc. at the fifteenth hour and one trial with 0.16 unit/cc at the second hour, the serum concentrations were 0.32 unit/cc. or higher from the first to fifteenth hours. Serum concentrations ranged from 0.32 unit/cc. at the eighteenth hour down to 0.015 unit/cc. at the twenty-fourth hour. Detailed data for this dose are given in table 4.

DISCUSSION

In clinical use of penicillin, the frequency of administration and quantity of material injected should be such that a bacteriostatic concentration against the organism causing the infection is maintained in the blood throughout the course of treatment. With most of the domestic animals, economy of material and the penicillin susceptibility of the organisms causing disease must both be considered in establishing dosage schedules. Among the equine pathogens, streptococci have been found to be inhibited *in vitro* by 0.02 unit/cc. of medium, *Shigella equuli*

TABLE 2—Romansky Formula,* 1,000 Units Per Pound Intramuscularly

Weight (lb.)	Units in total dose	Units of penicillin per cc. of serum at specified intervals following injection in hours 1	2	4	6	8	10	12	13	14	15	16	17
850	850,000	0.32	1.28	0.32	0.08	0.02	0.02	0.00	...	0.00	0.00	0.00	0.00
1,070	1,070,000	0.64	1.28	0.32	0.04	0.015	0.015	0.015	...	0.00	0.00	0.00	0.00
1,070	1,070,000	0.32	1.28	0.32	0.16	0.02	0.02	0.015	...	0.00	0.00	0.00	0.00
710	710,000	0.32	1.28	0.32	0.04	0.015	0.00	0.00	...	0.00	0.00	0.00	0.00
980	980,000	0.64	0.64	0.64	0.32	0.08	0.04	0.02	...	0.00	0.00	0.00	0.00
1,000	1,000,000	0.32	0.64	0.64	0.16	0.015	0.00	0.00	...	0.00	0.00	0.00	0.00
880	880,000	0.16	0.64	0.32	0.08	0.04	0.015	0.00	0.00	0.00	0.00	...	...
1,100	1,100,000	0.16	0.32	0.32	0.16	0.04	0.015	0.00	0.00	0.00	0.00	...	...
1,240	1,240,000	0.32	0.32	0.32	0.16	0.08	0.04	0.02	0.00	0.00	0.00	...	...
1,260	1,260,000	0.32	0.64	0.64	0.32	0.08	0.04	0.02	0.00	0.00	0.00	...	...

*Merck and Company, Inc., Rahway, N. J.

by 2.0 to 4.0 units/cc., and *Corynebacterium equi* by 8 to 10 or more units/cc.[6] Of this group, it appears that only the streptococcal infections would respond to penicillin therapy. Clinical experience with infections caused by *S. equuli and C. equi* indicates that they are refractory to penicillin therapy. In a list compiled by Kolmer[7] of organisms highly susceptible to penicillin, those of interest in veterinary medicine are *Bacillus anthracis*, the clostridia, staphylococci, streptococci, and some of the diphtheroid bacteria. *Actinomyces bovis, Clostridium chauvei, Erysipelothrix rhusiopathiae, Leptospira canicola,* and *Leptospira icterohemorrhagiae* are listed as moderately susceptible to penicillin . In further discussing the subject, Kolmer states that it is to be expected that penicillin will be found effective only for those conditions in which the infecting organism is highly or moderately susceptible to the antibiotic agent, *in vitro,* in general with inhibition by 0.02 to 2.0 units/cc. of medium.

The results obtained in this study with single injections of 500 units/lb. of body weight using penicillin in oil and wax (300,000 units/cc.) indicate that injection intervals of eight hours should maintain continuously a measurable quantity in the serum of most individuals (table 1). In most cases, the serum level over a greater part of the eight-hour period was 0.04 unit/cc. or less, and probably would be ineffective except for diseases caused by the most highly susceptible bacteria.

In ten dosage trials, 1,000 units/lb. maintained measurable concentrations in the serum for periods ranging from eight to twelve hours (table 2). Concentrations, adequate for complete or partial inhibition of penicillin-sensitive organisms, were uniformly present for eight hours with zero levels and partially inhibitory concentrations occurring on the tenth and twelfth hours. It is probable that this dosage rate would be satisfactory against many streptococcal and staphylococcal infections of the large domestic animals if given at twelve-hour intervals.

With doses of 2,000 units/lb., a great variation was found in the duration of the detectable blood level (table 3). If an average time is selected for maintaining a continuously measurable blood level in the majority of subjects, this dosage rate probably should be given at intervals not to exceed fifteen hours. Judging from serum concentrations obtained during the first twelve hours, it appears that this dosage rate would be satisfactory for intensive treatment of acute conditions caused by or-

TABLE 3—Romansky Formula,* 2,000 Units Per Pound Intramuscularly

Weight (lb.)	Units in total dose	Units of penicillin per cc. of serum at specified intervals following injection in hours								
		1	3	6	9	12	15	18	21	24
500	1,000,000	0.32	0.32	0.32	0.64	0.16	0.08	0.08	0.015	0.02
480	960,000	0.16	0.32	0.16	0.08	0.32	0.32	0.08	0.015	0.00
380	760,000	1.28	0.64	0.08	0.08	0.04	0.00	0.00	0.00	0.00
420	840,000	0.32	0.32	1.28	0.16	0.16	0.08	0.02	0.00	0.00
430	860,000	0.64	0.64	0.32	0.16	0.08	0.08	0.00	0.00	0.00
410	820,000	0.64	1.28	0.16	0.015	0.015	0.00	0.00	0.00	0.00
310	620,000	0.32	0.32	0.64	0.64	0.32	0.015	0.00	0.00	0.00
520	1,040,000	2.56	1.28	0.32	0.015	0.00	0.00	0.00	0.00	0.00

*Merck and Company, Inc., Rahway, N. J.

TABLE 4—Romansky Formula,* 4,000 Units Per Pound Intramuscularly

Weight (lb.)	Units in total dose	Units of penicillin per cc. of serum at specified intervals following injection in hours								
		1	3	6	9	12	15	18	21	24
500	2,000,000	2.56	2.56	1.28	0.64	0.32	0.08	0.04	0.015	0.00
480	1,920,000	5.12	1.28	0.64	0.32	0.64	0.32	0.08	0.04	0.015
380	1,520,000	1.28	0.64	0.64	0.64	0.64	0.32	0.16	0.16	0.08
420	1,680,000	0.64	0.64	1.28	0.64	0.32	0.08	0.08	0.04	0.015
430	1,720,000	0.64	0.64	0.64	0.64	0.64	0.32	0.16	0.16	0.08
410	1,640,000	0.32	0.16	0.32	0.64	0.64	0.32	0.32	0.08	0.08
310	1,240,000	1.28	0.64	1.28	0.64	0.64	0.32	0.16	0.08	0.04
520	2,080,000	0.64	2.56	1.28	1.28	0.64	0.64	0.16	0.04	0.015

*Merck and Company, Inc., Rahway, N. J.

ganisms having a penicillin sensitivity within the blood level range if administrations were made at twelve-hour intervals.

With the exception of one trial, doses of 4,000 units/lb. maintained effective serum levels throughout the 24-hour period (table 4). These results suggest that it may be possible for the Romansky formula to be used satisfactorily by making injections at 24-hour periods in the large domestic animals. Such a procedure would be considerably more convenient for the practitioner; however, the clinical response of infections of domestic animals to penicillin therapy has not been determined satisfactorily. It is probable that the different infections of domestic animals should be treated with doses of 500 to 1,000 units/lb. at eight- or twelve-hour intervals to reduce cost. These problems should be clarified as information becomes available on the sensitivity of animal pathogens and clinical response of patients at various dosage levels of penicillin.

A limited amount of data on the blood level response of sheep and cattle to injections of penicillin in oil and wax indicates that they respond approximately the same as horses in serum concentration and duration of the detectable blood level. At the present time, the same dosage levels can be suggested for treatment of disease caused by penicillin-sensitive organisms in cattle and sheep. This material will be the subject of a later report.

SUMMARY

In general terms, dosage of 500 units/lb. of body weight with penicillin in oil and wax (300,000 units/cc.) at eight-hour intervals will continuously maintain a measurable quantity of penicillin in the serum. In some animals, zero levels will occur before the eighth hour following injection and in others, penicillin will remain in the serum for nine to ten hours or longer. It is probable that serum levels obtained with this dose will be effective only for diseases caused by organisms which are very highly susceptible to penicillin.

Dosage at the rate of 1,000 units/lb. produced a blood response with a duration varying between eight and twelve hours. The serum concentrations were such that they should be generally satisfactory for therapeutic purposes. It is probable that this will be the most useful dosage level for the large domestic animals if administered at twelve-hour intervals.

With doses of 2,000 units/lb. there was a variation between nine and twenty-four hours in the duration of the blood level. The mean variation with this dose indicates that injection intervals should not exceed fifteen hours. From the serum concentrations obtained during the first twelve hours, it appears that use of this dose at twelve-hour intervals should be satisfactory for intensive treatment of acute diseases caused by penicillin-sensitive organisms.

Single injection at 24-hour intervals with a dose of 4,000 units/lb. will, in most cases, constantly maintain satisfactory blood levels. Except for the last three hours of a few trials, the serum concentration should be sufficient for therapeutic purposes in diseases caused by most of the penicillin-sensitive bacteria.

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Second Generation Offspring of Artificial Insemination

The New York Artificial Breeding Association has made the first categorical report to the effect that breed improvement is not endangered by artificial insemination. Hard as it is to make further improvement on already high-producing cows, the Association reports 12 second generation daughters that produced 13,070 lb. of milk and 462 lb. of butterfat, which was 1,031 lb. of milk and 57 lb. of fat more than their dams. This remarkable demonstration in favor of artificial insemination was made by William J. Summerville and Son of Oswego County. Because of the high starting average, the record is convincing.—*From Farm Journal, August, 1948.*

Squamous Cell Carcinoma in a Mink

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NEOPLASMS in domestic fur-bearers are rarely reported. Gray[1] in England, observed that "cancer" was occasionally encountered in foxes. In a ten-year autopsy study of fox and mink, Chaddock[2, 3] reported that neoplasms were found in both of these species. It is not known if the cases described by these workers were based on gross examinations only, or whether they were confirmed by histologic study. We have been unable to find any reference in the literature to any case reports which would confirm their diagnoses. An adenocarcinoma of the uterus occurring in a mink has been described by Graves.[4]

Fig. 1—Squamous cell carcinoma at the base of the tail in a mink (ventral view).

Schlotthauer[5] described three neoplasms occurring in silver foxes. These he reported to be an osteogenic sarcoma of the facial bones and mandible, an adenocarcinoma of the thyroid gland, and a pinealoma. Although his diagnosis of an osteogenic sarcoma may be correct, his description resembles in all details a case of advanced rickets. We have seen cases of advanced rickets in the fox where the maxillary bones were greatly enlarged, yet the curvature of the leg bones was not noticeably pronounced. Microscopically, this enlargement of the maxillary bones simulates an osteogenic sarcoma or monostotic fibrous dysplasia.

CARCINOMA IN A MINK

In June, 1947, a tail from an adult female mink (age unknown) was brought to this laboratory for examination. The owner reported that he had noted a large growth on the tail and, believing it would eventually cause the death of the animal, had amputated the tail with the growth.

On the ventral surface, at the base of the tail, was situated an irregular mushroom-like enlargement (fig. 1), 4 by 4.2 by 2 cm., which was grayish red and firm.

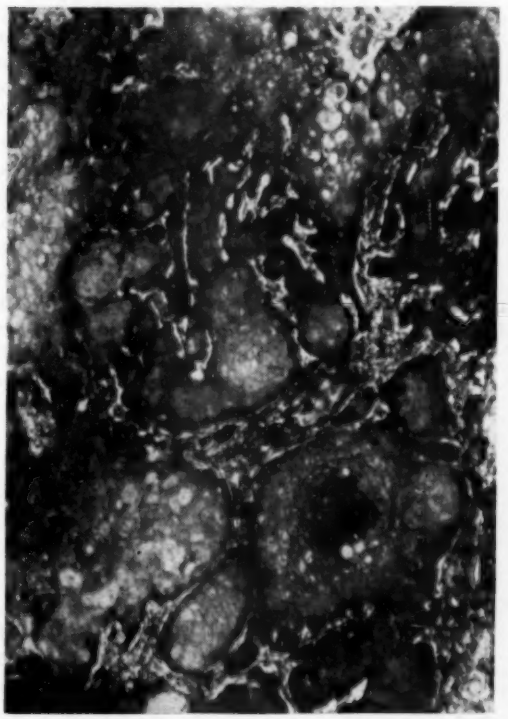

Fig. 2—A typical view showing irregular masses of enlarged epithelial cells (low power). x 125.

From the Bureau of Animal Industry, U. S. Department of Agriculture, in coöperation with the State College of Washington, Agricultural Experiment Station, Fur Animal Disease Research Laboratory.

On its anterior border, it displayed two nodular extensions, 1 by 1 by 1 cm. Encapsulation was not evident and the surface was not suppurative. On the cut surfaces, the tissue was firm, opaque, white, and glistening.

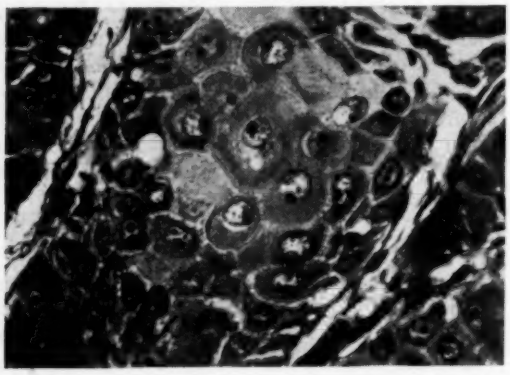

Fig. 3—Neoplastic epithelial cells showing intercellular bridges and prominent nucleoli (high power). x 250.

Histologically, the growth consisted of elongated strands and many clusters of large, pale epithelial cells enclosed in a loose stroma deep within the subcutaneous tissue (fig. 2). The atypical squamous cells showed abundant cytoplasm and hyperchromatic nuclei with an increase in the nucleolar size. In the center of some of the clusters, the cells were large (40 to 80 μ) and in this area the cellular outlines were poorly distinguished. In other clusters, central groups of concentric keratinized cells were present. Intercellular bridges were evident (fig. 3) and occasional mitotic figures were seen. Near the surface, in the stroma, scattered lymphocytes with a few polymorphonuclears were present. Areas of necrosis were scattered throughout the connective tissue.

Two months later, the mink succumbed for unknown reasons and was brought to this laboratory for further examination. Necropsy showed no gross lesions. The lymph nodes draining the tail displayed no gross metastasis. Sections taken from the heart, lungs, liver, spleen, kidneys, and gastrointestinal tract revealed no microscopic metastasis.

The diagnosis was squamous cell carcinoma (grade 1) with subacute inflammation.

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The Tick Vectors of Q Fever

Q fever was named for Queensland (Australia) where, in 1937, it was recognized as a specific entity. At about the same time, it was found to be occurring in Montana, as in Queensland, among persons concerned in the care of cattle, on the hoof or in abattoirs. The specific agent, *Rickettsia burneti*, was found to be carried by various cattle ticks, *Haemaphysalis humerosa*, in Australia and the *Dermacentor andersoni, D. occidentalis, and Amblyomma americanum* in the U.S.A. The disease first gained prominence through endemics among American, New Zealand, and British troops in Greece in 1944. Later investigations incriminated ticks of camels, sheep, goats, and certain rodents. Experimentally infected goats, sheep, and cattle suffer from a febrile illness during which the rickettsia circulates in the blood.

In man, a period of incubation of twelve to twenty-three days ushers in a prodrome of headache, vomiting, aching, malaise, and fever, the latter lasting about six days. Outbreaks in Greece, Switzerland, and among the laboratorians of the National Institute of Health indicated that the rôle of ticks is not absolute.

Neither penicillin, the sulfonamides, nor administration of immune serum has any marked action on the disease. Studies have shown that streptomycin has a curative effect on guinea pigs injected with large numbers of the organism.—*Brit. M. J., June 12, 1948.*

Lactation

Primarily, the capacity to secrete milk is subordinate to the quantity of healthy mammary tissue involved in the secretory process. On the long run, stimulating agents have but little effect on the amount of milk secreted during a given period of lactation. A controlled test on women (*Brit. M. J.*, May 29, 1948) revealed that Lugol's solution did not affect milk yield and the stilbestrol appeared to affect lactation adversely.

Spirochetes Associated with Dysentery in Dogs

JOHN E. CRAIGE, V.M.D.
Seaside, California

IN MAKING a fecal examination of a dog with an otherwise unexplainable diarrhea, a large number of spirochetes were observed. Subsequent observation of the case suggested that they might be etiologically significant and stimulated a clinical study of intestinal spirochetes and their relationship to dysentery in dogs. These organisms have been reported, associated with enteritis in dogs, on at least three other occasions. Jungherr,[1] in 1937, reported an organism which he termed *Treponema eurygyrata* in the intestinal tract from 1 of a group of 15 greyhounds suffering from diarrhea. Cultural and histopathologic studies led to the conclusion that the spirochetes seemed to be the sole agent capable of causing the mucodesquamative enteritis. He refers to a report by Nishiyama[2] that *Spirochaeta eurygyrata* is the prevailing form in animals and that it is more frequent in individuals suffering from intestinal disturbances than in normal ones, and that it can be treated by the oral administration of 1:300 arsaminol in saline solution on an empty stomach. Nishiyama quotes another report by Lucet[3] of a hemorrhagic enteritis in dogs associated with spirochetes. In spite of these promising leads, there seems to have been very little additional study of intestinal spirochetes in dogs.

The spirochetes referred to in this report are 10 to 15 μ in length and have from 2 to 5 loosely coiled spirals. They are vigorously motile on their own axis but do not often make much headway in the medium, although they are capable of quite rapid movements. They can be seen readily in a direct examination of a thin preparation of feces by using reduced light and a 4 mm. objective. The organisms are illuminated in a dark field, but the additional preparation necessary for a dark-field examination is not necessary or practical in a clinical study. Furthermore, the highly refractile material present in most fecal slides makes a dark field more difficult to examine. This spirochete bears a close resemblance to the one described by Jungherr[1] and shown in the plate accompanying his article. Although it has been named both *Spirochaeta eurygyrata* and *Treponema eurygyrata*, under the current nomenclature, it probably should be termed *Borrelia eurygyrata*.

FINDINGS

Spirochetes have been found in the feces of 112 dogs, 90 of which suffered from some degree of dysentery. In 19 of the dysentery cases, other pathogens were present also: Proteus in 7 cases, coccidia in 6 cases, and Giardia in 9 cases; but the spirochetes appeared to be the only causative organisms in 71 cases of dysentery. The 22 dogs without symptoms of dysentery were apparently healthy carriers. This figure must be discounted somewhat, due to the unreliability of the owners' statements, especially when the diarrhea is mild or infrequent.

In an attempt to determine the incidence of spirochetes and other enteric pathogens in dogs, fecal slides were examined from 130 dogs selected at random. Spirochetes were found in 61 (47%) of the dogs. Of the 73 cases of dysentery, 41 (56%) had spirochetes in their feces, as did 20 (35%) of the 57 with apparently normal bowels.

SYMPTOMS

The severity of the symptoms depended to a great extent on the age when infected and the presence of parasites or other pathogens. Many dogs showed only mild intermittent diarrhea. Others developed a more severe chronic dysentery. In others, especially puppies and debilitated animals, the spirochetes caused an acute dysentery with blood and mucus that frequently ended fatally after a few days.

TREATMENT

Treatment also depended on the severity of the symptoms and the age of the dog.

This the second in a series of three reports on pathogens infecting dogs by John E. Craige, V.M.D., Seaside Calif. The first, "Proteus Organisms Infecting Dogs," appeared in the August, 1948, JOURNAL, pp. 154-156.

Older dogs with mild dysentery could usually be cured by treatment with intestinal sulfa drugs alone. However, the sulfa drugs were found to be not so effective in the acute cases or the chronic dysenteries. Streptomycin, administered orally in doses of 50 to 500 mg. once daily, has been used in these cases with some benefit,[4] but the best results were obtained by using both sulfa drugs and streptomycin orally and parenteral injections of 100,000 to 300,000 units of penicillin in oil and beeswax once daily. Jungherr[1] demonstrated that the organisms penetrate into the mucous membranes and the Lieberkühn glands, probably accounting for the difficulty in effecting permanent cures in some cases. Except for a few very acute cases and some with fits, all cases have shown improvement from this treatment. Relapses occurred, but most of the cases became apparently cured after two or three courses of treatment.

CASE REPORTS REPRESENTING VARIOUS SYNDROMES

Case 1.—A 4-month-old German Shepherd female had been suffering from diarrhea for two weeks at the time of the initial examination. Her temperature was normal and there were no other symptoms of disease, except inappetance and loss of weight. A fecal examination and rectal cultures failed to reveal any protozoan or bacterial pathogen, but a large number of spirochetes were found in the feces. After three days' treatment with sulfaguanidine, the dog became normal and negative for spirochetes. No relapses occurred and the dog was still apparently normal six months later.

Case 2.—An English Setter female was shipped to Monterey from one of the south central states at the age of 3 months. It had dysentery with blood and mucus on arrival, although no enteric pathogens could be recovered on rectal culture and no coccidia could be found. Treatment with sulfaguanidine seemed to relieve the symptoms; but, after two weeks of hospitalization, the dog was not cured, although it was discharged with instructions to rehospitalize if it did not become normal. The animal was next seen six months later when it was presented for euthanasia, stunted, and in poor condition, with very bad dysentery. An examination revealed a large number of spirochetes in the feces. The owner agreed to allow the dog to be used for experimental purposes. Sulfaguanidine was administered for seven days without any noticeable improvement. Streptomycin was tried orally with equally unsatisfactory results. Then the two drugs were combined for four days, but the dog still passed bloody, watery stools six to eight times daily. As a last resort, penicillin was added to the treatment in intramuscular injections of 300,000 units in oil and beeswax once daily. The dog improved immediately and passed formed bowel movements six days later. She was kept for further observation; and, although apparently normal, she was subject to attacks of diarrhea in which spirochetes could be demonstrated. These attacks could be stopped and the spirochetes eliminated from the feces by two or three days' treatment with sulfathalidine. She is still in good condition eight months later and the attacks of diarrhea are becoming less frequent.

Case 3.—An 8-weeks-old Cocker Spaniel with fits was presented for examination. It was one of a litter of 6, all of which had diarrhea for four or five days and had been off feed for a longer time. This was the only puppy of the group in which fits had been observed. An examination of the feces revealed a large number of spirochetes, with no other enteric pathogens. The same organisms were found in all the other puppies when they were tested. None of them showed any symptoms of distemper or respiratory disease. The entire litter was hospitalized and treated with sulfathalidine, streptomycin, and penicillin; all recovered uneventfully, except the puppy first presented which died the next day.

DISCUSSION

The mass of clinical evidence, the number of cases treated, and the results of treatment, as well as clinical observations too detailed to be included in this report, support the suggestion by Jungherr[1] that spirochetes can cause enteritis in dogs. As in his study, the findings are not conclusive; but they serve as a practical basis for differential diagnosis and rational treatment of dysentery until more controlled research can be conducted with these organisms.

Although most of the cases in this report came from the vicinity of Monterey, Calif.,

several dogs have been examined immediately after arriving from other sections of the country and have been found to harbor spirochetes. This, and the fact that other reported cases are from Connecticut, France, and Germany, indicates that the organisms are widespread.

Similar spirochetes have been found associated with afebrile diarrhea in 6 cats. All recovered after treatment with sulfathalidine.

SUMMARY

A spirochete that should probably be called *Borrelia eurygyrata* has been observed in 112 dogs. It was the only apparent cause of dysentery in 71 cases. Twenty-two dogs were found to be healthy carriers. Approximately half of 130 dogs tested harbored this organism.

Sulfa drugs were effective in the treatment of the milder cases; but, due probably to the invasiveness of the organisms, they could not cure the acute or chronic cases of dysentery. Good results were obtained in most of the serious cases by combining streptomycin, penicillin, and sulfa drugs.

Similar organisms have been found associated with afebrile diarrhea in cats.

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[3]Lucet, M.: Sur le presence de Spirochaetes dans un cas de gasroenterite hemorrhagique ches le cheirr. Compt. Rend. Soc. Biol., *151*, (1910): 260-262.

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It is estimated that the leucosis complex was responsible for almost 40 per cent of the mortality among laying hens in 1946. —*Poultry Trib., March, 1948.*

Anaplasmosis Treated with Antimalarial Drugs.—Paludrine and quinoline diphosphate are experimentally promising treatments for bovine anaplasmosis, according to the Oklahoma Veterinary Research Institute, of the Oklahoma A. & M. College, and Pawhuska, Okla. About 85 per cent of treated cattle recovered, though they remained as carriers.—*Am. Hereford J., Apr. 1, 1948.*

Diagnosis by X-Ray of Interstitial Pneumonia

The patient, a 6-year-old male Beagle, with a history of having led a happy and healthy life, was brought to our office for examination on June 22, 1947.

The following symptoms had been noticed by the owner: peculiar bronchial cough; nervousness; disliked being alone; eyes markedly inflamed, discharged pus;

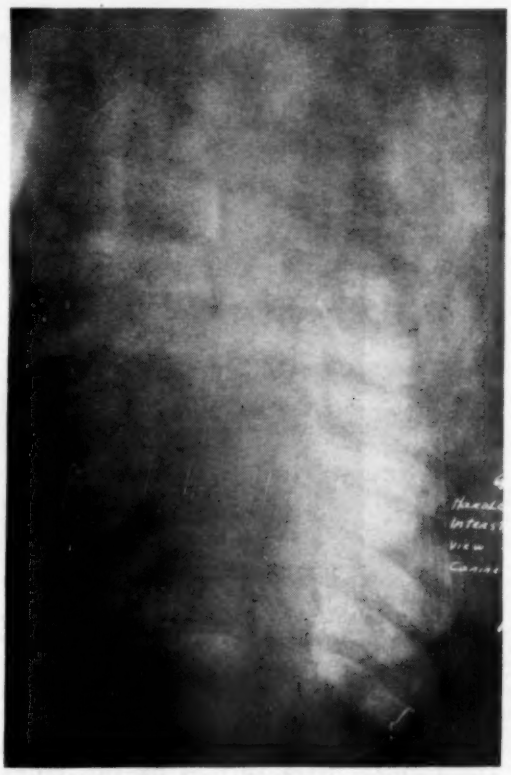


Fig. 1—Ventral-dorsal view shows enlargement and diffuse shadow of the left lung with lesser similar lesions of the right lung.

anorexia, ate only raw meat and that sparingly; drank very little water; marked stiffness and incoördination. Dyspnea was noticed four days later. The animal lay down most of the time, although he breathed harder than when standing. The temperature was 101 F. and the pulse was practically normal. There were marked rales and metallic sounds in the lungs, the left one being the more affected. The urine and feces were scanty because of the small quantity of water and food taken. There

was a fetid odor to the breath characteristic of niacin deficiency.

The diagnosis was pneumonia with complications. A radiograph revealed interstitial pneumonia, similar to the virus interstitial pneumonia of human beings, which can be diagnosed only by radiograph. The pictures were verified by two radiologists who had had much experience with the human form.

This condition is characterized by increased lung size and density, with accentuated lung markings. In later stages, small areas of consolidation appear as a result of infiltration of the parenchymal tissues, after they coalesce. Other types of pneumonia can be differentiated as to the location and types of lesions in conjunction with clinical findings.

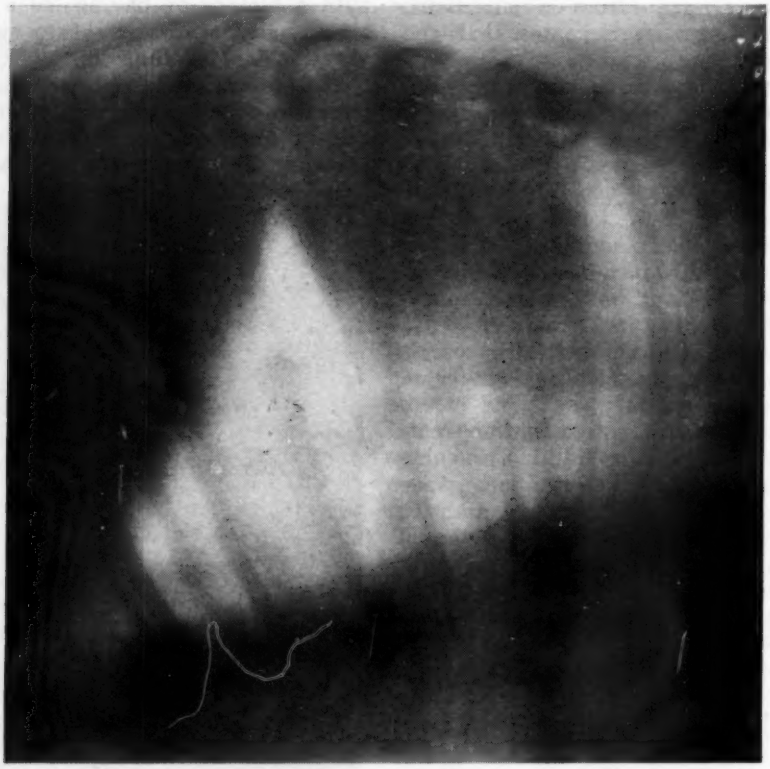


Fig. 2—Left lateral view, shows enlargement of lung and mottled lung lesions throughout. As in human beings, this condition is characterized by absence of high temperature, whereas bronchial pneumonia of bacterial origin is accompanied by an elevation of temperature.

We are informed by physicians that the clinical picture of the disease in the human being is almost identical with those described in this report.—*J. V. Hills, D.V.M., and R. L. Hall, D.V.M., Gowanda, N. Y.*

Soft Corn for Cattle.—Of the four methods of utilizing soft corn for fattening beef cattle, feeding it as ear-corn silage is the most profitable, with shocked corn next in preference. The third choice is to leave corn in the field and husk as needed. The least efficient is the wasteful method of "cattling" it down.—*W. M. Beeson in Breeder's Gazette, Oct., 1947.*

Various investigators have observed that if two doses of glucose are administered (orally or parenterally) at one-hour intervals, the second dose incites considerably less hyperglycemia than the first. The hyperglycemia produced by the first dose stimulates the assimilatory mechanism, causing the second dose to be assimilated at a much higher rate.

Possible X Disease Outbreak in Wisconsin

J. W. BAILEY, D.V.M.
Fort Atkinson, Wisconsin

EARLY in June, 1948, I was called to see some purebred Guernsey cows that were afflicted with a puzzling skin disorder. Examination of the herd showed 3 animals with serious skin lesions, 1 slightly affected and about 15 others showing only scattered skin swellings like those following fly bites.

The 3 seriously affected animals refused feed, had been scouring intermittently, and had almost entirely ceased to produce milk. The fourth animal showed no symptoms in addition to the skin lesions, except for a fetid black diarrhea. None of the other animals in the herd seemed to be affected in any way.

Temperatures were taken of the 4 markedly affected animals, and 2 of them showed high readings; 1 of 106 and the other of 105.2 F. The herdsman had not checked temperatures previously, but had suspected fever in several of the animals. Closer examination revealed that each of the animals showing temperature had a pulse rate approaching 90 per minute with a respiration rate of 80. All 4 of the animals were carefully checked for mouth lesions, but none were found. The skin lesions varied from loss of hair and raw sores over the neck, sides, back, and legs of 3 animals to a leather-like thickening and loss of hair over the neck in the fourth cow. Heparinized blood samples were taken of the 2 most severely affected cows for later determination of the white cell count.

History of the herd showed that the cattle had been into a woods pasture for the first time in the spring about ten days before our call, and that the skin lesions had appeared shortly afterward. However, 1 cow had showed symptoms of illness a week before the herd had gone out to pasture, though it was not recalled whether skin lesions were present at that time. It was also considered probable that some of the less severely affected animals might have shown some of the "fly bite" type of lesions before going to pasture. Once they were noticed, the skin lesions were believed to be due to sunburn or ivy poisoning through exposure in the woods. However, the increasing severity of the disturbance had caused the herdsman to ask for the veterinary service.

Investigation revealed that in each of the 4 most severe cases, the skin lesions had first appeared over the jaws, neck, and shoulders of the animal and had later spread over the back and legs. These lesions caused intense itching. The cows went off feed and dropped in milk production at about the same time that the lesions appeared. Although the trouble was not believed due to parasites, skin scrapings were taken from 2 animals for later microscopic examination.

The owner was advised that no definite diagnosis of the trouble could be given, but that it might well be X disease or hyperkeratosis. Accordingly, the 4 animals affected most severely were isolated as much as possible and cared for so as to prevent possible spread of disease. A preparation was dispensed to allay the intense itching, and it was recommended that a program of watchful waiting be followed for the next few days. Part of this program called for taking temperatures of the 4 cows several times daily, and keeping a close watch on the rest of the herd for new cases or changes in the status of the "fly bite" cases.

Check calls were made during the next two days, and the itching was effectively controlled. The animals improved to the extent of eating a little cut green grass, and 1 even increased milk production by about 10 lb. per day. The temperature was demonstrated to be of the undulating type, but the high peaks of 105 and 106 F. persisted in 2 of the cows. Three of the 4 cows also showed periods of extremely rapid and labored breathing, with the respiration rate at times exceeding 100 per minute.

The skin scrapings were found to be negative. The blood samples showed a normal white cell count of 5,700 for 1 cow, while a leucopenia was demonstrated in the other animal with a count of 2,100. In view of the New York work that showed leucopenia to be rather constant in the

so-called X^2 disease described by Dr. Olafson, this count was considered to be of possible significance. After talking the matter over with the owner, another veterinarian was called for consultation.

While still considering the possibility of X disease or some variant, skin treatment with saponified cresol and Massengill's oil was suggested. Dosage with sulfapyridine was suggested for the high temperatures, with the most seriously affected cow immediately receiving 500 cc. of 12 per cent sodium sulfapyridine solution intravenously. A composite skin scraping was taken from the 4 cows and examined later at the university laboratory.

On the following day, the temperature of each animal was normal, and the 2 cows that had been sickest were eating a little and appeared better. The first application of cresol followed by oil was made, and the feeding of an appetizing powder was instituted.

Within the next two days, however, all apparent gains were lost, and we were notified that 1 of the cows was unable to rise without assistance. We found it down, extremely depressed, with a faint pulse, and low normal temperature. In spite of stimulants and a 1,000-cc. transfusion of citrated blood, the animal died early in the afternoon of the same day. Two of the remaining cows were also quite sick, while the third was unchanged—it being the 1 that had never been severely affected. The dead animal was sent to the rendering plant, and no postmortem was performed. At about this time, we received a report from the laboratory that confirmed our earlier negative findings on the skin scrapings.

During the next two days, there was little change in any of the cows at the farm. On the third morning, however, the herdsman called to report that a second cow had died during the night. On arrival, we found that the dead animal was 1 of the original 3 that had been very sick, and the individual that had showed a leucopenia. We advised against opening the animal around the buildings, so the carcass was hauled to the woods where it might be buried after a postmortem examination. Findings were as follows:

Acute gastritis in the abomasum and enteritis to and including the cecum. Enlargement of, and petechial hemorrhages in, many of the lymph glands along the alimentary tract. A hemorrhagic condition throughout the omentum and mesenteries. Mottling of the spleen and acute inflammation of the mucosa of the urinary bladder. No ulcers were found at any point in the digestive tract, and all other organs appeared normal.

Samples of the various organs were sent to the university laboratory, where examination showed them to be free of parasites. No attempts at culturing or inoculation of test animals were attempted at the laboratory.

Another cow of the original 4 died about a month after the first call. She was the 1 with the "fly bite" type of skin lesions and the persistent black diarrhea. This cow had apparently been making a gradual recovery, with a good appetite, a slow increase in milk secretion, and no further loss of weight. No postmortem examination was made.

The remaining animal was disposed of for beef. No new cases have been reported.

While it is realized that this report lacks a great deal in definitely establishing X disease or hyperkeratosis as the cause of trouble, the symptoms, mortality, and course of the disease are highly suggestive of this disturbance. This being true, it is suggested that other practitioners be on the alert for similar cases.

The absence of ulcers in the esophagus and digestive tract is not considered reliable proof that X disease was not involved. In the New York outbreak of 1946 we noticed, with Drs. Olafson, Fox, Rickard, and others, that the ulcers were frequently of a transitory nature and capable of disappearing overnight. When it is remembered that in this case symptoms had been developing for ten or more days before we were called, failure to find ulcers may not be considered unusual. It is also possible that this is a variant of X disease and that ulcer formation is not one of the symptoms.

Calves are born with negligible reserves of vitamins A and D.

Toxic Property of Linseed Meal.—Linseed meal contains a toxic substance that depresses chick growth, but a simple water treatment of the meal destroys this harmful substance.—*Poultry Sci., March, 1948.*

Melano Sarcoma of the Eye with Metastasis to the Kidneys and Ovaries

On Aug. 9, 1947, a particolored Cocker Spaniel female, 5 years of age, was presented because of marked lacrimation of the right eye. Examination disclosed a severe conjunctivitis and ophthalmitis, accompanied by a slight degree of exophthalmia and apparently some pain.

Ophthalmoscopic examination revealed a slight opacity of the lens attended by a definite anterior senechia and some opacity of the vitreous humor. A diagnosis of ophthalmitis was made, and the treatment prescribed was penicillin ointment (ophth) locally, hot packs to the eye, and 50,000 units of penicillin orally every three hours.

The following day, the condition appeared to be markedly improved and treatment was continued. In addition, carotene in oil, 10 drops a day orally plus 1 to 2 drops a day in the eye, was prescribed. Telephone conversations with the owner in the next several days indicated that the dog was improving and the case was considered improved if not cured.

About two weeks later the dog was brought to the office, the owner stating that t had seemed to be improving until two iays before, when the eye started to swell. Examination revealed a marked degree of exophthalmia, accompanied by marked inflammation of the entire eye and pain. Enucleation was recommended and accomplished, and was attended by an uneventful recovery. On section, the eye presented a thick black substance and while a melanotic tumor was suspected no microscopic study was made.

On Dec. 3, 1947, the dog was brought to the office, lame in the left hind leg. Examination revealed marked swelling and pain about the femorotibial articulation. A diagnosis of acute arthritis was made and aspirin, along with thiamin hydrochloride (25 mg. a day), was prescribed, to be accompanied by application of mild heat to the area.

The animal seemed to improve for a time but on December 15 was returned with a more marked swelling about the same area. At this time, an acute infection of the joint was suspected. The temperature at this time was 102.5 F. Penicillin in wax and oil, 200,000 units, was injected and oral administration of 50,000 units every four hours prescribed. After four days, there was a very noticeable improvement and in a few days more, a complete remission of symptoms and absence of swelling.

On Jan. 14, 1948, the dog was returned, again presenting symptoms of grave intoxication but no apparent pain. The buccal mucous membrane presented considerable congestion and bled readily along the gingival margins. Nicotinic acid, 50 mg., was administered and 30 mg. orally prescribed, along with tonamine with liver. Forced feeding of orange juice and karo syrup and forceful administration of fluids was recommended.

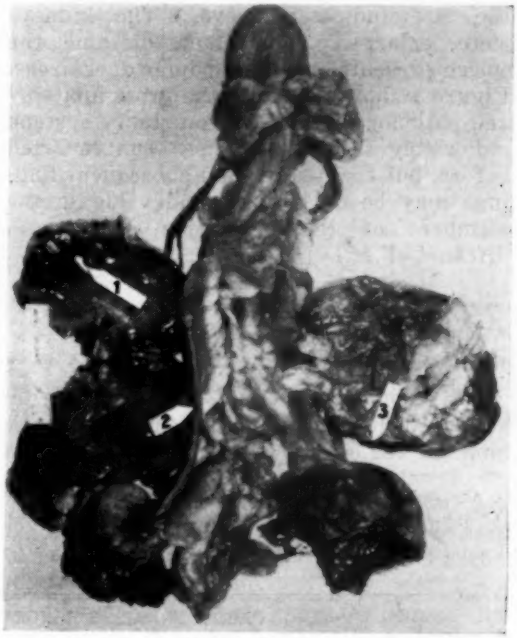


Fig. 1—Gross anatomy and pathology of the genito-urinary system, showing (1) lesions in kidney, (2) uterine horn, and (3) ovary.

On January 21, the dog was again returned. The only sign of any improvement was a recession of the gingivitis. The dog had retained all food and water forced upon it but would not eat or drink voluntarily.

Several stimulant tonics were tried, but the dog continued on a down-hill trend until January 30, when it was again returned to the office. Abdominal palpation at this time revealed two pendant and freely movable masses. Fluoroscopy showed these to be x-ray opaque (slightly) and about 4 by 6 cm. in size. I was frankly puzzled and

suspected the presence of an anatomic anomaly such as unusually pendant kidneys.

The dog was catheterized and a slightly blood-tinged urine obtained. It was planned to make a complete urinalysis on the following day, but the dog died about four hours later. Autopsy revealed a marked congestion of the entire genito-urinary tract, with enlargement of the ovaries to the size indicated above. The kidneys were enlarged and lobulated, and the spleen presented several nodular dark areas. Figure 1 shows in detail the gross anatomy and pathology of the genito-urinary system.

Possibly such a case has been reported before, but the history and subsequent findings may be of interest and value to the members of the profession.—*Sidney J. Michael, V.M.D., Erie, Pa.*

A Movement to Control Rabies in the U.S.A.

On recommendation of the National Research Council in 1947, a federal commission for the control of rabies in the United States has been formed from the following constituted agencies:

U. S. Public Health Service.
Federal Security Agency.
U. S. Bureau of Animal Industry.
U. S. Fish and Wildlife Service.

This commission, which is now active, has drafted a pattern of control methods for adoption by the states. These include:

The latest diagnostic techniques.
An accurate system of reporting.
Information for local authorities.
Licensing and dog-control ordinances.
Educating the public to coöperate.

Services, funds, and personnel for national rabies control will be made available by the U. S. Public Health Service through its:

Veterinary Public Health Division, Rabies Branch.
Division of Infectious Diseases and Division of Biological Control, National Institute of Health.
Public Health Reports, Division of Public Health Methods.
Public Health educators for lay groups and radio visual training.

The program is far-flung and complete since the USPHS is authorized to assign

Abstracted from "Proceedings, Conference for Veterinarians, Ohio State University, June 16-18, 1948." Paper by James H. Steele, D.V.M., U. S. Public Health Service.

—*U. S. Department of Agriculture.*

Figure 1

veterinarians to the states requesting federal aid, and grants-in-aid funds are available under Title VI for the operation of public health programs. Thus federal funds, for the first time, may now be used in rabies control.

TABLE I—Incidence of Rabies

Year	Dogs	Cattle	Horses	Sheep	Swine	Cats	Goats	Miscellaneous	Man	Total
1938	8,452	413	32	164	42	207	11	44	47	9,412
1939	7,386	358	36	17	38	269	10	172	30	8,314
1940	6,194	326	25	53	71	260	4	277	28	7,238
1941	6,648	418	39	68	159	294	9	212	30	7,877
1942	6,332	288	15	48	32	250	12	160	28	7,165
1943	8,515	349	35	45	60	316	19	310	41	9,690
1944	9,067	561	32	40	43	419	14	311	53	10,540
1945	8,505	487	46	11	30	466	10	373	35	9,963
1946	8,384	962	44	15	22	455	12	956	22	10,872
1947	6,949	766	40	15	20	393	9	728	26	8,946

The table was compiled by the U. S. Bureau of Animal Industry.

Rabies in England and in the U.S.A.

From a survey of the literature on rabies in England and the United States, appended to a detailed report of a case of human rabies in Texas, Dr. J. M. Barnhart (*Biol. Abstracts*, Sec. F., Jan., 1948: 18) points out that whereas in England, due to rigid control, rabies has been eliminated in both man and animals, the disease is still an important problem in the U. S. A., particularly in California, Tennessee, and Texas.

In England, the last case of human rabies occurred in 1903, or forty-five years ago, and the same could be said of animal rabies but for a few scattered cases due to smuggling dogs from the continent during World War I, all of which were cleaned up by 1923.

Rabies—Better to Remove the Cause

The treatment of rabies infection by means of the usual 15 to 21 daily injections of carbolized rabies vaccine, successful as it has proved to be, is far from being a universal cure. In fact, for bites on the bare skin of the face or hands, it is more nearly true to pronounce it a universal failure. Moreover, taking the course of injections is a nerve-racking, time-consuming, and quite painful ordeal. The duration of the immunity conferred is short—probably no more than seven months. The presence of rabicidal antibodies in the serum of the vaccinated person is no clew to the degree of protection conferred; they (the antibodies) may or may not appear in the serum after the close of the treatment. Strangely, persons with a high antibody titer may not be protected and may die from rabies. The antirabies treatment, besides the fear of it, may cause fever, headache, giddiness, cutaneous rash, and, in rare instances, prolonged and even fatal paralysis, the nature of which is that of encephalomyelitis. None of this is fable nor exaggeration. On the contrary, the need of taking an antirabies treatment is a major misfortune of anyone's life. It would not be necessary to do so were the cause—the rabid dog—removed.

Critical Tests of DDT Toxicity in Man and Animals

Extreme exposure to DDT of workers engaged in insecticide work continuously over long periods was not harmful, although the arms, hands, and other parts of the bare skin were constantly exposed to splashing and dripping of the 5 per cent spray. This was true even though, in confined places (ships, barracks, camps), white crystals of DDT could be seen on the exposed skin. In tests made in England, man and animals (guinea pigs, rabbits, and rats) were exposed to aerosol DDT for twenty-seven and a half hours over a period of five days. The tests were conducted in heavily treated rooms with restricted ventilation without the persons or animals showing evidence of intoxication.—*F. M. G. Stammers and F. G. S. Whitfield: Toxicity of DDT in Man and Animals, Abstract Rev. Applied Entomol. (Sept., 1947): 146-147.*

Foot-and-Mouth Disease in a Mexican Herd

The following case report of a Mexican dairy herd was secured by Mr. Will J. Miller, Livestock Sanitary Commissioner for Kansas. Mr. Miller's letter follows:

"On May 31, 1948, we visited the rancho "La Patera," located on the north edge of the Federal district, 3 mi. west of the Laredo Highway.

"Upon arriving at the ranch, the herd was being released from the milking sheds; this gave us a very good opportunity to observe them on their way to pasture. We found them in fair flesh, but many of them were lame in one or more feet, and several animals were noted to have one or more quarters of their udders showing atrophy. The dairy herd had been vaccinated for foot-and-mouth disease the week previous to our visit.

"We were fortunate in being able to contact the owner, Mr. F. C. McCann, and the following information was obtained from him in person.

This herd consists of approximately 500 animals. In December, 1946, a form of blister appeared on the udders of the milking cows. This condition was at first considered to be cow pox but did not give a true picture of the disease. Some salivation was noted.

Mr. McCann attended a meeting of dairymen in Mexico, D. F., and the subject of foot-and-mouth disease was discussed. The symptoms fit the condition of his herd, so he felt sure that his herd must be infected with foot-and-mouth disease. He immediately called in a veterinarian who confirmed his suspicions. They did have foot-and-mouth disease.

The entire herd became infected within two months, with quite a heavy death loss. In three months, 75 adult animals died, as did practically all calves that were on the farm at that time. There were several abortions also. At this point, all calves that were born alive were sold at birth to avoid any further loss from that source.

There was a severe outbreak of mastitis in the herd and many animals had to be sold and, as stated above, there are several animals with deficient udders that will soon be sold.

The milk production of the herd dropped from 3,000 liters per day to 1,200 liters. It has slowly increased but, at no time, has it reached more than 2,400 liters per day. The increase however was mostly due to the addition of heifers and not due to the recovered animals in the original herd.

There has been no profit in the herd since the outbreak, and for the most part the income from the milk has just about paid the expenses of the farm and no more. Mr. McCann made the statement when we first arrived that he hoped we had come to kill all his animals for they certainly were not profitable to keep, and that a large number of them would have to be sold for market.

A 2 per cent creolin solution was used twice a day as a mouth and udder wash. A copper sulfate foot bath was prepared for the animals to walk through. In fact, every known remedy was used to clear up the condition but very little good results were obtained.

There were 80 heifers in a pasture some distance from the main farm. One heifer was noticed to be infected, so a swab was taken of her saliva and smeared on the tongues of each of the other heifers. All heifers became infected but developed a mild form of the disease. There was only one death that could be attributed to foot-and-mouth disease. There were however several abortions among the heifers.

The hog herd was separated from the dairy herd by 50 to 75 yards. A mild infection broke out in this herd, with only a small percentage showing evidence of the disease.

There were about 50 sheep on the farm with no effort made to isolate them. There was only 1 that showed any noticeable symptoms of foot-and-mouth disease.

There has been no second outbreak of the disease in the herd and, as stated above, there was practically 100 per cent of the herd infected the first two months. The herd has not returned to normal in nearly one and a half year's time.

"Mr. McCann was very coöperative and stated that he is willing at any time to use his influence and efforts to control foot-and-mouth disease. He also stated that it was almost impossible for him to estimate the actual loss in dollars that the disease has caused him, but he wished, for the present, that he was in some other sort of business.

"On June 9, 1948, we again visited the ranch to observe the herd and if possible obtain further information.

"Mr. McCann stated that previous to the outbreak of foot-and-mouth disease, there had been no mastitis in the herd. He also stated that two and a half or three months ago he had decided to start raising his own calves again. There were 20 calves there at the time of our visit, ranging from 1 week to 2½ months of age. These calves were in good condition and had shown no effects of breaking with foot-and-mouth disease. The calves were vaccinated at the same time as the herd."

Foot-and-Mouth Disease Research

Press reports concerning the foot-and-mouth disease research laboratory about to be established in the United States leave the erroneous impression that this is a pioneer project. In fact, no virus infection has been more critically studied for as many years in as many countries than has foot-and-mouth disease; nor has any contagion of man or animals been more thoroughly clarified from cause to effect. The researches of the veterinarians of Great Britain, France, Italy, and Germany on foot-and-mouth disease are nothing less than brilliant. What remains to be discovered is a cheaper and more abundant supply of vaccine, a potent chemotherapy, additional facts on its mysterious flights from place to place, and increased durability of vaccinal immunity. That most of the groundwork has already been done is frankly acknowledged by the veterinary service but not by the public press.

"Mexican Foot-and-Mouth Disease Quarantine Line Being Pushed Further South" is the general tone of headlines on the f.-and-m. situation in Mexico, but Dr. M. S. Shahan (*Kansas Stockman*, June, 1948), head of the U. S. staff, warns against confusing the change in the quarantine line with the actual process of eradication.

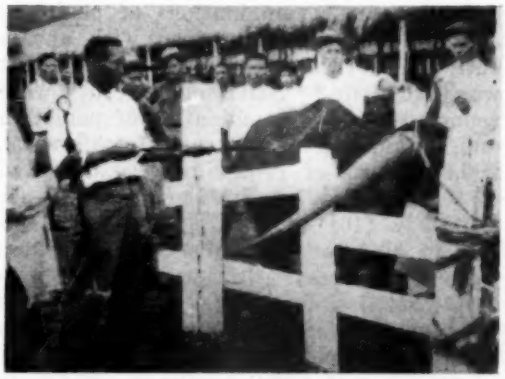
Rinderpest in the Philippine Islands

Dr. Angel K. Gomez, of the College of Veterinary Science, University of the Philippines, Manila, writes:

"In my article, Eradication and Control of Rinderpest in the Philippine Islands, published in the August JOURNAL (pp. 109-118), the amount of $45,000,000 (p. 112) should be $27,500,000; the original figure represents pesos. Also will you be good enough to substitute the following for reference 19:

Robles, M. M., and Generoso, J. D.: Dried Rinderpest Vaccine. Philippine J. Anim. Ind., *1*, (1934): 33-42.

"I am enclosing two additional pictures which are of historical value and interest in connection with my article."



—Courtesy of the P. I. Bureau of Animal Industry

Fig. 2—Branding immunized carabao before discharging from the immunizing station at San Fernando, Pampanga.

—Courtesy of the P. I. Bureau of Animal Industry

Fig. 1—Partial view of one shed of the immunizing station at San Fernando, Pampanga.

Sulfamethazine in the Treatment of Acute and Chronic Mastitis

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SIGNIFICANT advances have been made in recent years in the treatment of bacterial diseases with chemotherapeutic agents. Following their successful use in human medicine, both penicillin and the sulfonamides have proved of practical value in the treatment of certain diseases of animals. Favorable results have been reported in the treatment of mastitis with penicillin.[1-6] Many reports have appeared, also, concerning the use of sulfanilamide in mastitis treatment, and results have varied from promising[7] to disappointing.[8]

During 1947, combinations of penicillin and sulfonamides were used with apparently better results than when either agent was used alone.[6, 9] Satisfactory results were reported[6] when a combination of penicillin and sulfamethazine was used. In this work, 200,000 units of penicillin were dissolved in 100 cc. of sodium sulfamethazine 10 per cent w/v (10 Gm.) and given in one infusion. All 14 quarters of 8 cows so treated were freed of mastitis. Quarters with various mastitis infections were treated[9] with combinations of penicillin and sulfanilamide or sulfamethazine. From 50 to 100 cc. of 30 per cent sulfanilamide in oil (15 to 30 Gm.) were used, plus 40,000 to 50,000 units of penicillin per quarter. Complete recovery took place in 79 of 95 infected quarters. Fifty cubic centimeters of sodium sulfamethazine 5 per cent (2.5 Gm.) or 10 per cent (5.0 Gm.) w/v, with 25,000 to 50,000 units of penicillin, were infused into each quarter. There was complete recovery in 40 of the 53 quarters treated.

This report deals with the treatment of both acute and chronic mastitis with a combination of penicillin and sulfamethazine.

CLINICAL CASES

All clinical cases covered by this report occurred in a purebred Jersey herd of 1,200 animals. About 700 were milking cows. The majority of the cows were maintained on 15 farms with 50 to 75 animals on each. The incidence of mastitis in these units was very low as individual care was the rule, and proper milking methods were practiced.

However, 200 cows were maintained in one main barn. These cows were machine-milked in an 8-cow milking parlor where individual care was lacking. In the passageways to the milking parlor, crowding frequently took place, causing udder injury. Of the animals in this barn, 75 per cent had a history of mastitis. Previous to the introduction of the treatment procedures described here, an average of 18 to 20 cows were in the mastitis line at all times.

Treatment with a combination of sulfamethazine and penicillin was instituted in October, 1946. A total of 110 cows, with 163 quarters involved, have been treated. Seven of these, with 9 infected quarters, were cases of acute mastitis. Diagnoses were made on the basis of physical examination, strip cup, and thybromol tests, and those giving abnormal milk and showing symptoms were treated. Microscopic examination of incubated quarter samples and cultural tests were routinely carried out.

Treatment. — The dosage was usually 50,000 to 100,000 units of penicillin dissolved in 50 cc. of sodium sulfamethazine 10 per cent (5.0 Gm.) or 25 per cent (12.5 Gm.) w/v, per quarter. All infusions were administered at twelve-hour intervals, immediately following milking, and left in the udder until the subsequent milking. The number of infusions administered depended upon the condition of the cows, as evidenced by the appearance of the milk. Treatment was continued until normal milk was produced, or the case was considered hopeless because of previous disease history, age, condition of the udder, and lack of response to treatment.

Chronic Mastitis.—Group 1 consisted of 86 cows with 119 infected quarters. *Streptococcus agalactiae* was isolated from 116 quarters, staphylococci from 2, and both organisms from 1. Of the 119 quarters, 113 (94.9%) were both clinically and bacteriologically free of mastitis after two to five

From Biltmore Dairy Farms, Biltmore, N. Car.

treatments. Six quarters did not respond to treatment. Two of these quarters had been classified by palpation (Udall's system) as slight-plus fibrosis with marked atrophy (S+A), 1 distinct fibrosis (D), and 3 very distinct fibrosis (D+). Table 1 summarizes the treatment in group 1.

Group 2 consisted of 17 cows with 35 infected quarters. Additional treatment was administered to cows in this group as some improvement had been apparent after the initial course of treatment. As might be expected, the classifications ranged from S+ to D+. Many of these infected quarters had a distinct fibrosis (D), or marked atrophy (DA), and some were extensively indurated (D+). *Streptococcus agalactiae* were isolated from 21 quarters, staphylococci from 2, both streptococci and staphylococci from 5, and 7 showed mixed infection. Twenty-five of the 35 infected quarters (71.4%) were clinically free of mastitis after six to ten treatments. Ten quarters did not respond to treatment. Table 2 summarizes the treatment of the cows in group 2.

TABLE 1—Treatment of Chronic Mastitis with Sulfamethazine. Group 1—94.9 Per Cent Recoveries

Units penicillin per quarter	Amount* sulfamethazine per quarter	Cows (No.)	Quarters treated (No.)	Number of quarters recovered after treatments 2	3	4	5	Quarters restored to normal —total	Quarters not recovered —total
25,000	10.0 Gm.	1	1	..	..	1	..	1	..
50,000	5.0 Gm.	3	3	..	2	1	..	3	..
	10.0 Gm.	4	7	..	..	5	1	6	1
	12.5 Gm.	4	5	..	1	1	2	4	1
80,000	5.0 Gm.	30	40	4	10	13	13	40	..
	12.5 Gm.	24	37	2	10	14	7	33	4
100,000	5.0 Gm.	13	17	2	3	5	7	17	..
	12.5 Gm.	7	9	1	5	3	..	9	..
Totals		86	119	9	31	43	30	113	6

Intramammary infusion, immediately following complete morning and evening milking.
*5.0 Gm.—50 cc. 10% w/v sterile solution sodium sulfamethazine. 10.0 Gm.—40 cc. 25% w/v sterile solution sodium sulfamethazine. 12.5 Gm.—50 cc. 25% w/v sterile solution sodium sulfamethazine.

Of the 138 quarters restored to normal, 11 became reinfected in 19 to 229 days after treatment. These were retreated and returned to normal after one to six infusions. From the end of treatment to the date of this report, normal milk was produced from 13 to 184 days in all quarters but one. In this, reinfection took place after forty-five days. It was restored to normal after three treatments, and normal milk has been produced for the seven days to the end of this survey period. In 1 cow, there was an acute flare-up in three quarters, one of which had been cleared of infection after ten infusions, and had produced normal milk for 264 days. This case

TABLE 2—Treatment of Chronic Mastitis with Sulfamethazine. Group 2—71.4 Per Cent Recoveries

Units penicillin per quarter	Amount* sulfamethazine per quarter	Cows (No.)	Quarters treated (No.)	Number of quarters recovered after treatments 6	7	9	10	Quarters restored to normal —total	Quarters not recovered —total
25,000	12.5 Gm.	1	2	..	2	..	..	2	..
50,000	12.5 Gm.	2	3	..	1	2	..	3	..
80,000	5.0 Gm.	4	11	5	3	..	..	8	3
	12.5 Gm.	10	19	1	5	3	3	12	7
Totals		17	35	6	11	5	8	25	10

Intramammary infusion, immediately following complete morning and evening milking.
*50.0 Gm. 50 cc. 10% w/v sterile solution sodium sulfamethazine. 12.5 Gm.—50 cc. 25% w/v sterile solution sodium sulfamethazine.

is included in the discussion on acute mastitis. Retreatment and results are shown in table 3.

Acute Mastitis.—A total of 26 cases of acute mastitis involving 34 quarters have been treated. Of these, only 3 cows have lost four quarters. Seven of these cows, with nine quarters involved, were treated within the period of this survey. Udders were hot, swollen, and painful, and the milk was watery or serum-like. Temperatures ranged up to 105 F., and inappetence was apparent. A combination of sulfamethazine administered intravenously and udder infusions of penicillin and sulfamethazine was used in treatment.

One intravenous injection of 250 cc. of sodium sulfamethazine 25 per cent w/v sterile solution (62.5 Gm.—approximately 1 gr./lb.) was administered to 6 cows, and 150 cc. (37.5 Gm.—½ gr./lb.) to 1 cow. Udder infusions of 100,000 units of penicillin dissolved in 50 cc. of 25 per cent sodium sulfamethazine (12.5 Gm.) were started simultaneously, and continued until normal milk was produced. If the cow's temperature was not normal in twenty-four hours, and she was still off feed, sulfamethazine was given orally. In 2 cows, 450 gr. of sulfamethazine powder, or a total daily dosage of 900 gr. (1 gr./lb.), was administered at twelve-hour intervals on the second and third days.

Marked improvement was usually noted within twenty-four hours. Appetites had improved, and temperatures had dropped in all animals, and in 4 cows had returned to normal. In 6 cows, normal milk was pro-

TABLE 3—Treatment of Reinfected Quarters

Units penicillin per quarter	Amount* sulfamethazine per quarter	No. quarters recovered on original treatment	Number quarters reinfected	Days between original treatment & reinfection	No. quarters recovered after treatments 1	3	4	5	6	Results
80,000	5.0 Gm.	1	1	19	..	..	1	..	..	119 days after treatment, milk still normal.
		1	1	21	..	..	..	1	..	119 days after treatment, milk still normal.
		4	2	209	..	..	..	..	2	184 days after treatment, milk still normal.
		2	1	206	..	..	..	1	..	127 days after treatment, milk still normal.
	12.5 Gm.	1	1	43	..	..	1	..	..	98 days after treatment, milk still normal.
		1	1	61	1	..	..	..	..	45 days after treatment, 2nd reinfection. Retreated 100,000 u. pen. in 50 cc. sulfamethazine, 3 infusions. 7 days after treatment, milk still normal.
		1	1	33	..	1	..	..	..	115 days after treatment, milk still normal.
		2	1	193	..	1	..	..	..	136 days after treatment, milk still normal.
100,000	5.0 Gm.	2	1	229	..	..	1	..	..	163 days after treatment, milk still normal.
	12.5 Gm.	2	1	145	..	1	..	..	..	13 days after treatment, milk still normal.
Acute mastitis		1	1	264	..	..	..	..	..	3 quarters involved. See Cow 2 in table 4.

*5.0 Gm.—50 cc. 10% w/v sterile solution sodium sulfamethazine. 12.5 Gm.—50 cc. 25% w/v sterile solution sodium sulfamethazine.

duced in three to six days. In the seventh cow, the temperature did not return to normal until the fifth day. The quarter remained swollen and hard and was drying up, and the milk was still abnormal. Table 4 summarizes the treatment of acute mastitis.

DISCUSSION

Reduced milk production, unmarketable milk, permanent damage to the udder, and forced elimination from the herd of infected cows, traceable to mastitis, cause a tremendous annual loss to the dairy industry. The amount of saleable milk produced and the length of time needed to return a cow to full production when infection occurs are factors of great economic importance to the individual dairyman. It is recognized that good management practices and sanitary measures used to prevent infection and injury are necessary in any control program. The effectiveness of the treatment of chronic mastitis depends to a great extent on the condition of the udder, particularly the amount of fibrosis present.

Highly satisfactory results have followed the use of the combination of sulfamethazine and penicillin in the treatment of both acute and chronic cases of mastitis in the herd reported in this paper. Intramammary infusions of penicillin alone had previously been used, but treatment had to be continued over long periods, sometimes as long as two or three weeks. Response was much more rapid with the combination treatment, and, frequently, cows were back in production in one and one-half to two days. Many of those cases with extensive fibrosis have cleared up much more rapidly than when the same type of quarter was treated with penicillin alone.

There are advantages in the use of intramammary infusions of a sulfonamide, such as sulfamethazine, in combination with penicillin. Because of the bacteriostatic activity of sulfamethazine against a wide range of bacterial genera, the growth of penicillinase producers may be inhibited. Also, it has been shown[10] that sulfamethazine diffuses freely from udder to blood and that effective blood concentrations are achieved following infusion of proper dosage. Therefore, effective concentrations of sulfamethazine may be established in secreting tissues.

Acute cases of mastitis, treated in the manner described within six to ten hours after the onset of symptoms, were usually under control within twenty-four hours, unless injury to the udder had taken place. With the intravenous administration of sulfamethazine, a prompt high blood level is obtained and the infection is overcome by phagocytosis. Maximum dosage will permit diffusion of adequate levels of sulfonamide in all body fluids.

In the previous experience with acute mastitis, the animals usually developed a septicemia and died. There have been no deaths, however, since the institution of

Table 4—Treatment of Acute Mastitis with Sulfamethazine

Cow (No.)	Quarters involved (No.)	Temp. (F.)	Treatment i/v injection sulfamethazine	Udder infusion	No. of infusions*	Results
1	1	105.0	62.5 Gm.	100,000 units penicillin dissolved in 50 cc. 25% w/v Na sulfamethazine (12.5 Gm.) per quarter, administered at twelve-hour intervals.	5	Temp. normal in 5 days; quarter hard, swollen, going dry.
2	3	105.0	37.5 Gm.**		9	Temp. normal in 2 days; milk normal in 2 quarters in 4 days, 1 in 5 days.
3	1	104.0	62.5 Gm.		4	Temp. normal in 1 day; milk normal in 3 days.
4	1	104.2	62.5 Gm.		5	Temp. normal in 1 day; milk normal in 3 days.
5	1	105.0	62.5 Gm.**		11	Temp. normal in 3 days; milk normal in 6 days. Quarter slightly enlarged.
6	1	105.0	62.5 Gm.		6	Temp. normal in 1 day; milk normal in 3 days.
7	1	105.0	62.5 Gm.		5	Temp. normal in 1 day; milk normal in 4 days.

*Infusions continued until normal milk was produced.
**30 Gm. sulfamethazine administered orally at twelve-hour intervals, second and third days.

the sulfamethazine-penicillin treatment.

In the experience with this herd, milk production was usually not affected by treatment. However, if 10 to 12 infusions were administered to a heavy producer with some atrophy of the udder, a tendency to dry up was noted.

In this herd, treatment of mastitis with a combination of sulfamethazine and penicillin has proved far superior to other treatments used.

SUMMARY

1) The treatment with sulfamethazine and penicillin of cows with clinical mastitis is described. Chronic infection was present in 154 quarters, and acute mastitis occurred in 9.

2) Intramammary infusions of 50,000 to 100,000 units of penicillin, dissolved in 50 cc. of sterile sodium sulfamethazine solution containing 5.0, 10.0, or 12.5 Gm. per quarter, were used in the treatment of chronic mastitis. Cows with acute mastitis were treated by the intravenous administration of sulfamethazine at approximately 1 gr./lb., plus intramammary infusions.

3) Of 119 infected quarters, 113 (94.9%) were both clinically and bacteriologically free of mastitis after two to five treatments.

4) Of 35 infected quarters, 25 (71.4%) were clinically free of mastitis after six to ten treatments. Due to the amount of fibrosis present in these quarters, past experience has shown that it is not economically advisable to treat these cows until they are bacteriologically free of mastitis.

5) Of 138 quarters restored to normal, 11 (7.9%) became reinfected 19 to 229 days after treatment, and were restored to normal after one to six treatments. One which became reinfected a second time after forty-five days, was restored to normal after three treatments.

6) Normal milk was produced in three to six days by eight of the nine quarters with acute mastitis, or 88 per cent.

7) There were no adverse reactions in any of the cows treated.

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Caprine Tuberculosis.—Two cases of active, generalized tuberculosis in goats are critically described by Barrillon and Molinari (*Rev. Méd. Vét., 98,* Nov., 1947: 487-489) and, as the authors point out, indicate that tuberculosis in goats and sheep should not be dismissed in meat inspection. Gross caseocalcareous lesions scattered over the costal, sternal, and diaphragmatic pleura, and involvement of the bronchial, esophageal, retrohepatic, splenic, mesenteric, pancreatic, and popliteal lymph nodes, portrayed the generalized character.

Sulfonamides in Coccidiosis of Chicks.—Of the sulfonamides used in the treatment and prevention of coccidiosis in chicks, Koutz (*Proc. Ohio Vet. Conf.*, June 16-18, 1948) found sulfaquinoxaline the most effective. Given four days on and four days off for five weeks, the chicks were immune to challenging doses of oöcysts. The dosage was 0.1 per cent of the total mash or 0.04 per cent of the total drinking water. Pursued for seventy days on the alternating schedule, the treated birds made the same gains as the controls. Confirming Delaplane, who was first to report on the use of sulfaquinoxaline in *Eimeria tenella* infection, the drug was "very efficient," and did not interfere with the development of resistance to coccidiosis.

Sulfonamides in the Prophylaxis of Experimental Fowl Cholera

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IN THE PAST, the control of acute fowl cholera has been unsatisfactory, the disease running its course with flock owners salvaging what birds they could. The development, however, of the newer sulfonamides provides potential agents for the control of pasteurelloses, not only in birds but in other domestic animals as well.

Sulfapyridine has been used successfully for several years in the treatment of pneumonias in the larger domestic animals, diseases usually regarded as being associated with pasteurella infections. The drug, however, never acquired favor in avian therapy, although Shanks[1] found M&B 693 (sulfapyridine) to be markedly effective in the control of a cholera outbreak in a small turkey flock.

More recent advances in sulfonamide therapy have produced drugs not only more potent than sulfapyridine against the Pasteurella group, but also less toxic to the host. Two of these, sulfamerazine and sulfamethazine, are being used in the treatment of calf pneumonia and hemorrhagic septicemia in cattle.[2-4] Results are regarded as substantially superior to any previous control measure. Sulfamethazine is also reported to be effective in the treatment of hemorrhagic septicemia in swine.[5]

In studies of natural fowl cholera outbreaks involving 27,600 chickens, the mortality in treated groups was reduced from 50 to 75 per cent with sulfamethazine therapy as compared with the untreated controls.[6] The drug was administered as 0.5 per cent of the mash or 0.1 per cent of the drinking water. Sulfaquinoxaline was effective in the prophylaxis of chronic fowl cholera in chickens[7] when administered at either the 0.1 per cent or the 0.05 per cent level in the mash.

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Appreciation is expressed to the Medical Division of Merck and Co., Inc., Rahway, N. J., for supplying the sulfaquinoxaline used in these studies; to the Lederle Laboratories of Pearl River, N. Y. for supplying sulfamethazine and sulfadiazine; and to Sharp and Dohme, Glenolden, Pa., for supplying sodium sulfamerazine.

In an effort to investigate further the activity of some of the sulfonamides in the control of experimental fowl cholera, groups of 4- to 6-week-old White Leghorn cockerels were placed on mashes containing varying concentrations of sulfonamide drugs. Twenty-four hours after being placed on the medicated mash, each bird was exposed intramuscularly to 0.04 cc. of a 24-hour broth culture of *Pasteurella multocida*, avian origin. The results are shown in table 1.

From table 1, it is seen that sulfaquinoxaline, sulfamethazine, and sodium sulfamerazine were all markedly effective in the prophylaxis of the disease under the conditions of the experiment. Sulfaquinoxaline, however, was effective in the lowest intake levels while sulfamethazine appeared to be somewhat superior, gram for gram, to sodium sulfamerazine. Sulfadiazine was intermediate in activity, while sulfathiazole and sulfanilamide were relatively impotent.

FIELD TRIAL

An opportunity was afforded for the field testing of a sulfonamide in the control of

TABLE 1.—Sulfonamide Drugs in the Prophylaxis of Acute Fowl Cholera of Experimental Origin

Lot No.	Chicks	Drug	Drug in mash (%)	Mortality in 48 hr. Total	(%)
1	20	None	..	20	100
2	10	Sulfamethazine	0.1	3	30
3	10	Sulfamethazine	0.2	0	0
4	10	Sulfamethazine	0.3	0	0
5	10	Sulfadiazine	0.1	9	90
6	10	Sulfadiazine	0.2	10	100
7	10	Sulfadiazine	0.3	10	100
8	10	Sulfadiazine	0.4	2	20
9	10	Sulfadiazine	0.5	1	10
10	10	Sulfathiazole	0.4	10	100
11	10	Sulfathiazole	0.5	10	100
12	10	Sulfathiazole	1.0	3	30
13	8	Sulfaquinoxaline	0.1	0	0
14	10	Sulfaquinoxaline	0.2	1	10
15	10	Sulfaquinoxaline	0.3	0	0
16	10	Sulfanilamide	0.5	8	80
17	10	Sulfanilamide	1.0	10	100
18	10	Na sulfamerazine	0.1	10	100
19	10	Na sulfamerazine	0.2	2	20
20	10	Na sulfamerazine	0.3	0	0

Nearly all mortality occurred within twenty-four hours following exposure. No mortality due to cholera occurred after forty-eight hours. Drug withdrawn at the end of the fourth day.

an outbreak of acute fowl cholera in a flock of 7,300 turkeys. Sulfaquinoxaline was selected for the trial. The history of the outbreak is as follows:

Acute fowl cholera appeared Sept. 14, 1947, in a flock of 1,750 market-size turkey hens, diagnosis being established by bacteriologic examination. The owner was in the process of marketing the birds at the time the outbreak occurred and the last of the group was disposed of by September 18. During the four-day interval, however, 40 birds succumbed to the disease. The origin of the outbreak is unknown. The farm was well isolated and no other outbreak of acute cholera is known to have occurred within 100 mi. of the area. The disease may possibly have been introduced by wild ducks, since these birds congregated in a swampy area adjacent to the turkey range and some of the turkeys were known to have been in the area frequented by the ducks. Fowl cholera has been shown to occur naturally in wild ducks.[6]

On September 21, the disease appeared in a group of 3,800 4-month-old turkeys maintained in an adjacent field and separated from the former flock only by a low fence. Some intermingling of birds between the two groups constantly occurred. On September 21, 22, and 23, 5, 8, and 16 birds were lost, respectively. On September 23, the group was treated with sulfaquinoxaline, 1:2,000 in the drinking water, medication being maintained for approximately thirty hours and continued for an additional eighteen hours at a 1:4,000 drug level. Two birds were lost on September 24, whereupon losses abruptly ceased. On September 26 and 27, each bird was vaccinated intramuscularly with 1 cc. of commercial avisepticus-gallinarum bacterin. Immediately after vaccination, the birds were moved to a clean field, the watering equipment being disinfected with a cholorine compound. Medication with 1:4,000 sulfaquinoxaline in the water was continued for thirty hours beginning September 28. A final treatment with 1:4,000 sulfaquinoxaline in the water was administered October 4 for a 24-hour period.

Occasional losses occurred up to the time the birds were marketed in December. Losses subsequent to medication were regarded by the owner as being within the normal range, and no loss was suspected as being due to cholera. The livers of 12 birds which died following treatment were examined bacteriologically without recovering *P. multocida*.

On September 23, fowl cholera appeared in a group of 1,750 near-adult toms maintained in a field approximately 500 ft. from the flock of young turkeys. No intermingling of birds occurred between the toms and the other two groups, but the same truck was used in the care of all three lots. A record of losses in this group follows.

Date	Birds lost
Sept. 23	7
24	2
25	6
26	1

On September 24, 25, and 26, 1,100 of these birds were marketed. The remaining 650 birds were placed on 1:4,000 sulfaquinoxaline in the water for seventy-two hours beginning on September 27. These birds were neither vaccinated nor moved to clean ground.

One tom each was lost on September 28 and 29. No further losses occurred until October 5 when 1 bird died. On October 6, 7, 8, 9, and 10, the losses were 1, 2, 2, 3, and 2, respectively. It was not possible to examine any of these birds bacteriologically, but recurrence of cholera is probable since the losses were characterized by brief illness, fever, and sudden deaths. Liver lesions characteristic of cholera were present. Sulfaquinoxaline medication 1:4,000 in the water was resumed October 10 for forty-eight hours. No further losses occurred in this group up to the time of their disposal on October 27, 28, and 29.

Further Experimental Work

In an effort to determine the end-point of sulfaquinoxaline activity in the prophylaxis of acute fowl cholera, 10-week old White Leghorn cockerels were placed upon varying concentrations of the drug in the water twenty-four hours before each bird was exposed intramuscularly with 0.001 cc. of a 24-hour broth culture of *P. multocida*, avian origin. The results are shown in table 2.

Sulfaquinoxaline under the conditions of the test (table 2) proved to be fully prophylactic

TABLE 2.—Sulfaquinoxaline in the Prophylaxis of Acute Fowl Cholera of Experimental Origin

Lot No.	Chicks	Sulfaquinoxaline in water (%)	Mortality 24 hr.	48 hr.	72 hr.	96 hr.
1	20	None	13	5	0	2
2	10	0.0500	0	0	0	0
3	10	0.0400	0	0	0	0
4	10	0.0300	0	0	0	0
5	10	0.0200	0	0	0	0
6	18	0.0100	0	0	0	0
7	8	0.0050	0	0	1	0
8	8	0.0033	0	3	0	0
9	8	0.0025	0	2	0	0
10	8	0.0020	0	3	1	1

against acute fowl cholera when administered in the drinking water at a level of 0.01 per cent which corresponds to a dilution of 1:10,000. The drug was withdrawn at the end of the fourth day. Subsequently, 1 bird succumbed in each of lots 7 and 9. None of the 6 survivors in lot 7 became affected with chronic cholera. All survivors in lots 8, 9, and 10 became so affected. The 18 birds in group 6 never at any time appeared to be affected as a result of the exposure, although they were observed for an extended period. Of the 20 controls, all succumbed within ninety-six hours.

DISCUSSION

In an uncontrolled observation, losses from fowl cholera abruptly ceased in a large turkey flock upon the administration of sulfaquinoxaline in the drinking water at either the 1:2,000 or 1:4,000 level. A controlled trial was impossible due to the absence of accessory watering facilities and the labor problems involved. It is felt, however, that the abrupt termination of losses following medication indicates substantial benefit from the treatment. The outbreak showed all the characteristics of acute fowl cholera including rapid spread, short duration, and sudden death. No affected bird recovered. Experience in the past has shown such an outbreak to progress, when unchecked, with devastation in flocks affected.

With our present knowledge, we must feel concern over possible disease recurrence even if cholera losses are stopped temporarily with medication. Theoretically, a logical way to circumvent this possibility would be to immunize the survivors with bacterin after losses have been suspended with sulfonamide administration in order to induce resistance against disease recurrence. The value of Pasteurella bacterins, however, has not been confirmed, although evidence has been presented [9-10] as to the effectiveness of autogenous bacterins in the prophylaxis of fowl cholera in ducks. It is impossible to determine from this observation whether the use of the commercial bacterin was of material benefit in the control of the outbreak. Cholera was not observed to recur in the vaccinated group, but this group was medicated three times and transferred to clean range. Cholera apparently did recur in the nonvaccinated group of toms following the initial drug treatment but did not reappear subsequent to the second treatment. Experience may demonstrate an intermittent program of sulfonamide medication to be sufficient for the control of fowl-cholera outbreaks.

In the field trial, sulfaquinoxaline medication at the 1:4,000 level in the water appeared to be as effective as medication at the 1:2,000 level. Subsequent work with chicks under controlled conditions showed the drug to be completely prophylactic at a 1:10,000 dilution in the drinking water (0.01%) after an exposure to cholera which resulted in complete mortality in the controls within ninety-six hours. This amazing activity may indicate sulfaquinoxaline to be a specific in the control of acute fowl cholera and possibly other Pasteurella infections.

SUMMARY

1) Sulfaquinoxaline, sulfamethazine, and sodium sulfamerazine were all markedly effective in the prophylaxis of experimental fowl cholera under the conditions of the trial and against the disease exposure employed. Sulfaquinoxaline, however, was effective in the lowest intake levels followed respectively by sulfamethazine and sodium sulfamerazine. Sulfadiazine, sulfathiazole, and sulfanilamide were much less effective.

2) In an uncontrolled trial, administration of sulfaquinoxaline in the drinking water at either a 1:2,000 or a 1:4,000 level was associated with abrupt termination of losses in a natural outbreak of acute fowl cholera in a large turkey flock.

3) Using experimental chicks, sulfaquinoxaline was fully prophylactic against acute fowl cholera when administered in the drinking water at a dilution of 1:10,000 (0.01%). With the disease exposure employed, 100 per cent of the controls succumbed to cholera within ninety-six hours.

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Sarcosporidiosis in a Cow

The report of this case is submitted because of the extensive infestation which was observed and because of what we believe to be the unusual opportunity of obtaining a general case history plus a postmortem inspection in the abattoir and a follow-up of the case in a pathology laboratory.

The owner brought the animal to the abattoir and reported that it had calved about six months previously, with no apparent after-effects. About a week earlier she went down and was unable to arise. Her appetite, good at first, gradually became poor and she lost weight until she was quite thin.

Postmortem inspection revealed no apparent mechanical injury to the spinal cord or other parts except for bruises laterally on each thigh and hip, due no doubt to the animal's attempts to arise during the six days she was down. The viscera appeared normal. The skeletal muscle throughout the carcass was pale, watery, and flaccid, and appeared to be in a stage of degeneration. A very few of the granular bodies usually found in cases of sarcosporidiosis were observed, but we hesitated to state positively that this parasite had caused the extensive muscle condition described because, if it had, it was by far the worst case of its kind we had observed in our fairly extensive experience in meat inspection. However, we tentatively diagnosed it as such, condemned the animal and explained to the owner what we had found. The owner then added that several months earlier another cow had shown similar symptoms and that the animal had died. No postmortem inspection had been made. These 2 cows and a third still living were a group of 3 he had purchased together.

Sections of the thigh and shoulder muscles were taken to the University of Michigan Pathology Laboratory where microscopic slides were prepared. The laboratory report showed "an unusually heavy infestation with sarcosporidia (Miescher's Tubes). Most of this is of the usual form but at intervals there occur huge cysts filled with sporozoa having the same general appearance." The laboratory report also pointed out the presence of chronic myositis with fibrosis and some hemorrhage.

We are indebted to Dr. Carl V. Weller (M.D.), professor of pathology at the University of Michigan, and his staff for their pathology report and to Dr. Hilton Smith (D.V.M.), of Iowa State College, formerly a graduate student in Dr. Weller's department at the University of Michigan, for additional study of the slides from the standpoint of veterinary pathology. Dr. Smith's study concerned the huge cysts referred to in the above laboratory report, which he believes were also sarcosporidia in spite of their huge size.

From referring to Ostertag's "Textbook of Meat Inspection," we believe this to be *Sarcocystis blanchardi*. The author describes such an extensive infestation with accompanying myositis to be found in exceptional cases.

The history and findings in this case may be of value to veterinarians who find cows that cannot get up and remain down a few days. This is especially true where the veterinarian has eliminated in his examination the possibility of trauma or of some mineral or other deficiency in the animal or its diet.

It should be pointed out that sarcosporidia in cattle are very common. Ostertag reports that microscopic study has demonstrated the presence of this parasite in 50 per cent or more of routine beef muscle specimens examined. The sarcosporidia are usually found in the primary seats of origin, such as esophagus and diaphragm, and in comparatively few cases are those in other parts of the carcass visible to the naked eye in meat inspection.—*George E. Bowler, city veterinarian, Department of Health, Ann Arbor, Mich.*

Brucellosis.—"Notify your local veterinarian when you have calves old enough for vaccination. The best age to vaccinate is 6 to 8 months," is the advice of the *Holstein-Friesian World.*

1947 Outbreak of Infectious Equine Encephalomyelitis in Louisiana

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DURING the summer of 1947, an epizoötic of infectious equine encephalomyelitis, that appears to have been one of the most virulent ever to occur in the United States, was experienced in the southern part of Louisiana. No references are made to outbreaks in other parts of the United States, or relative to the nature of the disease, as this merely is a report of this particular epizoötic which seems to have been of sufficient importance to justify its review. Although the area covered was not nearly as extensive as in some other epizoötics in the United States, the disease was accompanied by a high death rate. The Department of Veterinary Science, Louisiana State University, received the first reports by telegram in response to telegraphic inquiry. During the months following the epizoötic, to complete the information, comprehensive questionnaires were sent out. In response, many gave detailed reports; others in areas from which it would be beneficial to have first-hand information did not reply. Because some practitioners work in three or four parishes (counties), it is not possible to get accurate figures relative to morbidity. Some of the county agents appeared to be well informed, others not. The map shown and figures given (*see* fig. 1) were worked up from information received from practitioners and agents. Due to the severity of the outbreak, the inability of practitioners to get to all the communities where needed, the fact that some areas are in the swamp lands and could not be adequately surveyed, and the fact that some men did not contribute the information needed, we believe that the figures given are low.

Thanks are hereby expressed to Dr. Trueting, Miss Howett, and Dr. Habel of the United States Public Health Service, the Bureau of Animal Industry, practicing veterinarians in Louisiana, county agents, staff members and students of the Department of Veterinary Science, Louisiana State University, and all others who assisted in securing and preparing the information used in the preparation of this report.

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EQUINE ENCEPHALOMYELITIS IN LOUISIANA

For several years, and particularly since 1937, there have been a few cases each year of what appeared to be encephalomyelitis and there was some vaccination. In some years, there were quite a few cases in localized areas, but this was the first epizoötic. The writer has believed that western virus was isolated from a specimen in 1940 or 1941, but recent attempts to find letters to confirm this have not been successful. Prior to 1945, most of the trouble was along the Mississippi River south of Baton Rouge, with some in the area that was involved so severely in the 1947 outbreak. Because of the general nature of the disease, it was believed that western virus was the etiologic agent. Perhaps the virus was typed but, if so, we do not have the information. There were several cases south of Baton Rouge and west of the Mississippi River in 1945. At that time, the writer was notified by Dr. A. H. Groth that eastern strain of equine encephalomyelitis virus had been recovered from a brain sent by him to the Bureau of Animal Industry. Quite a few cases occurred in the same area and some in Washington and St. Tammany parishes in the northeast corner of the Florida parish section of the state in 1946. Fifty-nine cases were reported by the state veterinarian, as shown in the Bureau of Animal Industry release of May 27, 1947.

THE 1947 EPIZOÖTIC

The first indication of this epizoötic came to our attention on Aug. 5, 1947, when a representative of one of the commercial houses asked what we knew of the extent of the disease. With no previous knowledge of the condition, and on the basis of the reports this man had received, we sent telegrams to some 15 practicing veterinarians in the south and southeast part of the state. Replies indicated that the disease was running wild. Further inquiries brought out the fact that the earliest case recorded was 1 diagnosed at Avery Island June 13 by Dr. George Broussard of New Iberia. The disease progressed generally north with a little

trend both east and west, then made quite an abrupt move to the west.

Epizoötiologic information on the 1947 outbreak is surely incomplete and no factual information was uncovered to indicate the reservoir from which it started, nor was there a fair explanation as to why the disease exploded. There were many conjectures, as is always true when the epizoötiologic information can not be tied down. The area where it started and from which it seemed to progress is at least 80 to 100 miles from where eastern virus was isolated in 1945 and where most losses occurred in 1946. The summer of 1947 was unusually dry, the low land seldom being flooded and flushed, so in some areas the mosquito population was exceptionally heavy, though this was not true of the whole area. One veterinarian even proposed that the mode of infection was the alimentary canal rather than by insect transmission because of these and other observations but, if so, what is the explanation for the progression of the disease? Many think that wind was responsible for it following the major directional course of west by north. However, we are informed by the weather bureau that the prevailing breeze in this general section of the state is from south-southwest to north-northeast.

Some believe that the infection was introduced by migratory fowl which inhabit the coastal area of Louisiana. There were no reports of dead birds in the many species of wild birds which frequent these areas of south Louisiana where the 1947 break started, but this does not mean that migratory fowl are ruled out as the reservoir of this infection.

The most concentrated area of infection was in the parishes of St. Landry, Acadia, Evangeline, and Jefferson Davis (*see* fig. 1). The peak of infection was in July and August. As indicated, the extent of infection in the area around these four parishes varied somewhat. The disease progressed generally westward and a little north from the point of highest concentration and seemed to run out of the state between the first and middle of October. Figure 1 indicates that there was some gravitation north and east, but the general trend was definitely west and slightly north. The last cases recorded were on November 27 by Drs. Goodwin and Reaux of New Iberia, who had 1 at Jeanerette in Iberia parish and Dr. Hargis, with 1 at Leonville in St. Landry parish.

In answering our question regarding mortality, we were generally given the figure 90 to 96 per cent. The actual figures given for morbidity and mortality, however, would indicate that the mortality was a little over 80 per cent. Reports from veterinarians, farmers, agents, agricultural teachers, and others indicate that many animals died on farms and in the swamps where veterinarians were never in attendance, so we feel the over-all mortality is actually nearer the 90 per cent generally stated.

On May 25, 1948, when it appeared we could get no more information from the men in some of the areas where there had really been trouble, figures were submitted to Dr. Simms, chief of the Bureau of Animal Industry, and to the U. S. Public Health Service. These figures were taken as being a fair appraisal of the information submitted by the practitioners and county agents. That report gave 14,334 animals affected, 11,727 deaths. These figures are considerably higher than those reported by the Bureau of Animal Industry in the information letter of June 1, 1948. We are sorry this information was not in the hands of the Bureau before its report was published, but we believe these figures are more accurate, at least more nearly tell the story, and therefore, for the benefit and information of all concerned, should be reported. Dr. E. P. Flower, state veterinarian, is of the opinion that these numbers are more accurate than those reported earlier, as they were compiled after several months of attempting to collect information.

The 1945 census estimated 91,642 horses and 83,616 mules in all the parishes involved and 29,223 horses and 19,712 mules in the four parishes experiencing the greatest losses in this outbreak of sleeping sickness. Due to the overlapping of territory covered by the veterinarians and incomplete or no reports from some areas, it seems that if we record our observations by count (event with the inaccuracies known), it will be more informative than a report on the basis of cases per 1,000 animals in each parish or even in the entire area. The Bureau of Animal Industry usually makes its reports on the basis of cases per 1,000 animals and they may prefer to report this epizoötic in that manner.

THE VIRUS

Without a doubt, the predominant strain of virus in this outbreak was the eastern strain. On Sept. 17 and 18, 1947, Dr. Richard Davis and Mr. J. C. Frazier of this Department visited the territory and collected samples. Two brains were secured; each was divided and half sent to the virus laboratory at Montgomery, Ala., and the other half sent to the National Institute of Health. Both laboratories recovered eastern virus from one, while neither was successful in isolating virus from the other. In both cases, the animal from which the brain was recovered was prostrate and appeared to be in the terminal stages of the disease. The animals were sacrificed and the specimens put immediately into a buffer solution. Our samples were taken to the virus laboratory at Montgomery by Drs. Bishop and Kissling who passed through Baton Rouge enroute to Montgomery from Iberia parish. These men had been in Iberia parish as part of a U. S. Public Health team working on the epidemiology of the disease and assisting with setting up a

mosquito control program. Specimens were sent to the National Institute of Health at Dr. James Steele's request. We are informed that at least one other sample was sent to the B.A.I. and that it revealed the eastern strain.

A particularly interesting observation is recorded in connection with samples of serum taken from recovered animals. We asked the veterinarians to find us animals that had recovered and which had received no drugs of any kind. Since this was the first real problem with encephalomyelitis in this territory, there had been very little and in most areas no immunization prior to this epizoötic. The virus laboratory at Montgomery gave the following report on six samples of serum taken from animals described above: Four carried neutralization bodies in high concentration and one in low concentration against eastern virus, while the sixth sample was negative. The particularly interesting record is that three of the same samples demonstrated a relatively high neutralization index against western virus, and a fourth was weakly positive. A fifth which was negative to western was the same one which was weakly positive to eastern. The other sample was negative for neutralization bodies to either eastern or western virus. There is the chance that some of these animals had been immunized with a western vaccine without the veterinarian knowing it, or it might be assumed that in these particular cases the animals actually had a mixed infection, but to the best knowledge of the veterinarians who located these 2 animals, they had not received any drugs.

VACCINATION

Vaccine was not readily available and even though the veterinarians drove day and night they did not immunize all the animals they were asked to treat, because there was not sufficient vaccine nor were there sufficient hours in the day. The majority of the practitioners used a bivalent vaccine, while some of them used almost entirely the eastern strain. Statistics are not complete on the number of animals immunized, but on the basis of what practicing veterinarians reported, it appears that at least 65,000 animals were immunized during the months of June, July, and August. There is no way to determine how much lay vaccination was carried on during the same time but, according to reliable information, considerable numbers of animals were vaccinated by laymen.

Two observations were brought out in answers to our questions regarding immunization. One is that some men seem to think the first injection of vaccine actually precipitated the disease in some animals. This might be difficult to prove, but it is the opinion expressed

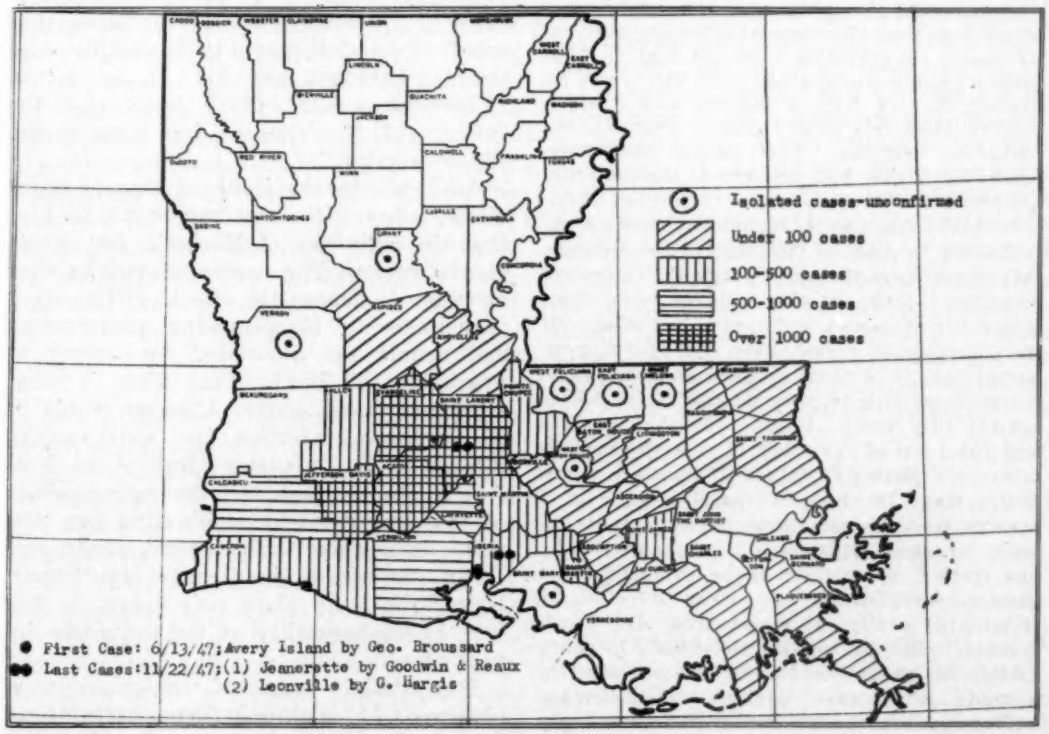
Isolated cases-unconfirmed
Under 100 cases
100-500 cases
500-1000 cases
Over 1000 cases
● First Case: 6/13/47; Avery Island by Geo. Broussard
●● Last Cases: 11/22/47; (1) Jeanerette by Goodwin & Reaux
(2) Leonville by G. Hargis

Fig. 1—Distribution of Infectious Equine Encephalomyelitis by Parishes in Louisiana in 1947.

by some of the men. Secondly, some men indicated that, due to the press of time, they administered both doses of vaccine at the same time. Of the two or three that did this, none reported what they thought was imperfect protection, but basically this certainly is not the correct way to immunize. This point was brought out very forcibly at the panel discussion on this disease during the short course held at the University in January.

PUBLIC HEALTH ASPECTS

During the course of the epizoötic, there were cases of encephalitis in human beings and, of course, much speculation as to whether they were associated with the infectious equine encephalomyelitis outbreak. The State Board of Health and several of the parish health units worked with the U. S. Public Health Service, and individually, to obtain information and plan control measures; in a couple of instances, mosquito control programs were established as a means of preventing spread to human beings.

At the meeting of the Louisiana Veterinary Medical Association in conjunction with the short course at Louisiana State University in January, 1948, Dr. W. L. Trueting, then president of the Louisiana State Board of Health, discussed the various viruses that cause encephalitis in human beings, the inability of the physician to tell what virus causes a specific case, and the methods that must be used in order to type the virus causing any particular case. Dr. Trueting reported that in 1946 eastern equine encephalomyelitis virus was recovered from 1 human patient who died in Charity Hospital, New Orleans, from an encephalitis complex. This person was from south Louisiana but the exact location was not given.

In 1947, there were 26 human cases of encephalitis in Charity Hospital, New Orleans, that came from the area where this epizoötic prevailed. Some of the patients came from farms where horses and mules had died. Of the 26 cases of encephalitis, Dr. Trueting reported that 15 of them revealed eastern equine encephalomyelitis virus or neutralization bodies against this virus. Equine encephalomyelitis was ruled out of the other 11 cases by various laboratory methods. Of the 15 cases, 1 was a Negro male 74 years of age, 1 a baby of 7 months, and the remaining 13 were under 15 years of age. Of these 15 cases proved by one method or another to be suffering from eastern encephalomyelitis virus infection, 9 terminated fatally and 6 recovered. Dr. Trueting also told of 2 contact individuals in south Louisiana, where the disease had prevailed in animals, that gave positive neutralization bodies against eastern virus. The first case reported in animals was in June. All cases in human beings appeared after September 8. We have heard of no explanation for the time lag in human cases as compared with the occurrence of the diseases in equine cases.

Ovine and Caprine Monieziasis

In his "Treatise on the Parasitic Maladies of Domestic Animals" (2nd ed., 1892), L. G. Neumann, pioneer parasitologist, wrote: "Next to the dog, the sheep is the domestic animal most frequently infested with tapeworms." In his "Veterinary Medicine" (vol. 5, 1909), James Law states that "*Moniezia expansa* is numerous and disastrous to small ruminants." In 1934, Dr. K. J. Skriabine and Dr. R. S. Schultz of Moscow reported to the *Office international des Épizooties* that enzoötics of monieziases are capable of causing a mortality of 80 per cent. Recently, H. Lafenêtre (*Bull. Acad. Vét.*, April, 1948) mentions outbreaks in southwestern France which caused a death rate of 5 to 25 per cent.

Per contra, in this country (excepting Law, *vide supra*), the literature tends to belittle the importance of *M. expansa*. Dr. T. W. M. Cameron in his *Internal Parasites of Domestic Animals* declares that proof of its pathogenicity is lacking, and Dr. G. Dikmans and Dr. D. A. Shorb (*Yearbook*, USDA, 1942) write that the "effect (of *M. expansa*) has been generally over-rated."

All-in-all, in the light of these contradictory views, it seems reasonable to hint that the pathology of Moniezia, spp. needs careful review. The current American view attempts to charge the effects of the given parasitosis to blood-sucking roundworms and acquit the associated tapeworms of practically all harm. That view is what appears to need study. A recent study of *M. expansa* infection in southwestern France by H. Lafenêtre (*Bull. Acad. Vét.*, April, 1948) established the pathogenicity of that tapeworm by eliminating any possible association with enterotoxemia, anthrax, strongyles, botulism, grass tetany, liver flukes, and plant poisonings, as factors in the mortality of the outbreaks investigated.

Two distinct forms of monieziasis were observed: (1) a chronic form characterized by slowly developing anemia, digestive troubles (irregular rumination, colic, rebel-

lious diarrhea), convulsions, profound asthenia, and cachexia as death approaches —in fact, a syndrome comparable to that of distomiasis and gastric strongylosis; and (2) an acute anthrax-like form characterized by sudden deaths. Sheep apparently well one day were found dead in the fold or pasture the next morning. Just before death, the victim isolated itself from the flock, stood stiff-legged with the head down to the ground or resting on the manger, and a mucoid saliva drooled from the lips. In both forms, *M. expansa* was the sole specific agent detected.

The autopsies revealed discrete lesions of septicemia, blackish blood, hypertrophy of the spleen, and congested viscera. Sick sheep sacrificed for postmortem examination showed no macroscopic lesions save the telltale load of tapeworms and an inconsequential number of roundworms.

Lafenêtre (*vide supra*) preconized the presence of a teniatoxin capable of manifesting itself rapidly and striking the central nervous system directly or, maybe, indirectly by provoking a mineral-endocrine debacle comparable to that of grass tetany. Being unarmed, *M. expansa* is not likely to invoke a grave microbial inoculation in the intestine, but the massive parasitic load may possibly favor the invasion of some microörganism yet to be put in evidence. In other words, the exact pathology of *M. expansa* is not clear, and its economic importance in sheep husbandry is so poorly established in the books written for the guidance of the clinic that practitioners writing on the treatment of ovine monieziasis generally start by apologizing for making ado over an unkind worm that the scientists call innocuous.

The Bacteria of Semen.—Bacteriologic examination should be included with the other methods of investigating the semen of bulls used in artificial insemination. In the semen of 3 bulls examined, Rempt and Wananburg (*Tijdschr. Diergeneesk., 7,* 1948: 224) demonstrated the presence of *Pseudomonas aeruginosa.* Although they do not regard such a contamination to be common, the authors consider it prudent to make such additional examinations.—*Abstr. Rec. d. Méd. Vét., 124, (June, 1948): 277.*

"Hardware" Abscess in the Spleen of a Horse

Being a careful masticator, the horse, unlike the ruminant, rarely swallows metallic objects. An exception was a 10-year-old draft horse hospitalized for a grave febrile attack (otherwise in excellent condition) lasting seventeen days. The attack was found, postmortem, to be due to a large abscess of the spleen developed around a straight piece of semirigid wire 6 cm. long and 1 mm. in diameter. The spleen, weighing 4 kg., was bound with adhesions to the diaphragm, liver, and stomach. Hyperthermia (40 to 41 C.), pollakuria, icteric membranes, polynucleosis, albuminuria, rapid coagulation, blood urea of 1.20 Gm. per liter, blood polypeptids 47.95 Gm. characterized the syndrome. Death occurred in a state of coma.—*R. Florio and R. Louf: Abscess of the Spleen Due to a Foreign Body, in a Horse (title translated). Rev. d. Méd. Vét. (1945). Abstr. Rec. d. Méd. Vét., 124, (June, 1948): 274.*

Hookworm Infection in Calves

Diarrhea developed in 4 calves following application of the eggs of the common hookworm (*Bunostomum phlebotomum*) to the skin and in only 1 calf infected *per os.* The diarrhea which began in twenty-seven to thirty-eight days following infection lasted ten to twenty-two days, and eggs were recovered as early as the fifty-seventh day after infection. All symptoms observed occurred during the prepatent period of infection, with general improvement following maturing of the larvae into adults, according to Mayhew (*Am. J. Vet. Res.,* (Jan., 1948) :35-39). This emphasizes the importance of barn and shade sanitation in controlling hookworm infection in calves.

Higher content in blood and greater liver storage are advantages reported for aqueous vitamin A over the oily form.—*Am. Druggist, Jan., 1948.*

The amino acid requirements of swine are not known, but it is known that a serious deficiency of any one necessary amino acid will cause poor feed utilization and growth failure.—*Feed Bag, April, 1948.*

Some Infectious Diseases of Domestic Animals in China
IV. Sheep and Goats

CHING-SHENG LO, D.V.M.
Nanking, China

IN PREVIOUS papers,* some infectious diseases of animals (cattle, horses, swine) in China were reported. This paper reports on some infectious diseases in sheep and goats.

Sheep Pox.—Sheep pox has existed for a number of years in the northwestern provinces, particularly Ning-hsia and Kansu. It occurs enzoötically, or sometimes epizoötically, in the late spring and early summer when vitality of the animals is low due to the scarcity of winter feed. Lambs as well as adults are affected.

The initial symptoms are dullness, inappetence, and tremors. There is an elevation of temperature to 41.5 C. in three or four days, dropping gradually to 38.5 C. At this stage, the animal is either dead or has recovered. During the fever, red spots erupt all over the body, particularly where the wool is scanty. The pox runs its course in from seven to ten days. Complications are not rare; the most common is pneumonia. In uncomplicated cases, the course of the disease is from twelve to eighteen days. Convalescent, defibrinated blood, or serum in doses of 40 to 50 cc. is highly satisfactory for treatment.

Goat pox has also been reported in the vicinity of Sian, but the disease is always benign.

Anthrax.—Sheep are very susceptible to anthrax which appears suddenly without any prodromal symptoms. The animal is usually down and dies in a convulsion within a few minutes. Sometimes death may be delayed for one or more hours.

Goats are just as susceptible as sheep. Several cases have been seen in Chengtu, Szechuen. The course is always peracute.

Caseous Lymphadenitis. — This disease has been known to occur in both sheep and goats and is usually diagnosed at postmortem examinations since the infected animals show no visible symptoms during life. Shu[1] performed autopsies on 200 goats in Lanchow and found 21 animals infected with caseous lymphadenitis. He found abscesses occurring in various parts of the body, mostly the lymph glands, and especially the mediastinal lymph glands. The causative organism has been isolated from the lesions.

Contagious Ecthyma.—Contagious ecthyma has not been reported in sheep in China, but it is seen frequently in goats. Both the young and the adults are attacked. The papular and vesicular stages are seldom observed in clinical cases. When seen, the animal usually has heavy scabs around both the upper and lower lips. General symptoms are usually lacking, except that the infected animal eats more slowly, and in severe cases may not be able to eat for some time. In milk goats, the secretion of milk is reduced considerably. The disease is benign and affected animals usually recover in about four weeks, even without treatment.

Malignant Edema. — Isolated cases of malignant edema have occurred in sheep. The writer reported a case in a Merino ewe after shearing.[2] When the animal was presented for examination, it refused to move; if pushed hard, it walked slowly and cautiously with a stiff gait; if urged to move faster, it would almost fall to the ground. On palpation of the thorax, rump, and especially the abdominal region, crepitating swellings were marked and apparently painful. The swellings were extensive, affecting practically the whole body. On incision into a small portion of the crepitating swellings, a brownish-red fluid oozed out. It was intermingled with gas bubbles and emitted a foul odor resembling putrid meat. Systemic disturbances were pronounced.

Infectious Pleuropneumonia of Goats.—Infectious pleuropneumonia of goats is

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*The following articles by Ching-Sheng Lo appeared in the J.A.V.M.A.: Some Infectious Diseases of Domestic Animals in China. I. Cattle. *109*, (Oct., 1947): 272-273; Some Infectious Diseases of Domestic Animals in China. II. Horses. *112*, (June, 1948): 436-437; Some Infectious Diseases of Domestic Animals in China. III. Swine. *113*, (Aug., 1948): 126-127.

prevalent in the northwestern provinces (Shensi and Kansu), but no systematic study has been undertaken.[3] Kwong reported an outbreak that occurred in a mountainous district in the vicinity of Lanchow, covering an area of about 30 to 40 square miles, in which more than 90 per cent of the goats succumbed. He made a detailed study of the causative organism, mode of infection, incubation period, symptomatology, and pathology. He also mentioned that sheep and the other domestic animals were not susceptible.

Rinderpest. — According to Hutyra, Marek, and Manninger[4] sheep and goats may be spontaneously infected with rinderpest but, under natural conditions in China, sheep and goats are not susceptible. In artificial inoculation of the rinderpest virus to sheep in limited numbers, the disease may be transmitted but the symptoms are slight, and chiefly catarrhal. On the other hand, goats are very susceptible to artificial inoculation; more than 95 per cent of those inoculated contract the disease.

After subcutaneous injection of 5 to 10 cc. of rinderpest blood virus, the incubation period is from three to seven days. The initial symptom is a rise of temperature (40.3 to 41.6 C.). The infected animal is depressed and at first eats normally, but three or four days later the appetite is diminished and sometimes completely lost. There is a discharge from the eyes and nostrils, at first mucous, later becoming mucopurulent. The lesion in the buccal cavity is not always constant; occasionally, it presents the typical lesion of rinderpest erosion and ulceration of the buccal mucous membrane. In the early stages of the infection, there is constipation, but when the temperature begins to drop, diarrhea sets in. Pregnant goats may abort. Death usually occurs on the eleventh day.

The mouth lesion has been described. The esophagus and the forestomachs are normal. The abomasum is congested and hemorrhagic spots are always present. The mucosa is dark red; ulceration is invariably present, and occasionally there may be edema. The large intestines are hyperemic and hemorrhagic and there are always inflammatory changes at the ileocecal valve; the color varies from pink-red to dark red, and there may be petechial hemorrhages. At times, the liver is congested. The amount of bile varies from 3 or 4 cc. to 160 cc. The kidneys are congested. The urinary bladder is usually normal, but sometimes a few petechiae are seen. The heart is flabby. The spleen is usually normal. There is not much change in the respiratory system, other than occasional slight congestion.

Hemorrhagic Septicemia.—Although this disease has been reported from many localities where sheep are raised, no detailed study of the malady has been made. A questionnaire on the distribution of infectious diseases of domestic animals in China by the writer brought only one reply which mentions hemorrhagic septicemia in goats.

Ovine Piroplasmosis. — Ovine piroplasmosis definitely exists in Tungkwan (Shensi), but whether it occurs in other sheep-raising districts is not known at present.

Foot-and-Mouth Disease.—During one of his trips to Sikong, Dr. C. T. Chen noted that, after an outbreak of foot-and-mouth disease in cattle, a number of goats were affected with the malady. The foot-and-mouth lesions were conspicuous but no detailed study was made. Foot-and-mouth disease also affected sheep in Sinkiang.

Tetanus and Rabies.—Both are rare, but may occur in sheep and goats.

Tuberculosis and Actinomycosis. — Neither of these diseases has been reported in Chinese veterinary literature. It would be interesting to quote a report by Tung and Chen[5] in the *Chinese Medical Journal* of a case of actinomycosis of the face and the upper molar region of a woman which was successfully treated with a crude lymph gland extract from a goat. According to the reporters, the lymph gland extract was prepared as follows: "Fresh goat lymph glands obtained from the slaughter house were soaked in 75 per cent alcohol for about fifteen minutes. The fatty tissues surrounding the glands were removed under aseptic conditions. The glands were then cut into small pieces, after which they were wrapped in a piece of sterile gauze and ground in a sterile mortar, into which 50 to 60 cc. of normal saline was added, until a jelly-like, juicy, pinkish extract was obtained."

The lymph gland extract was used to irrigate the facial wounds twice daily, and on the fourth day, actinomyces had almost completely disappeared from the discharge. The infected teeth were extracted and sulfur granules were found in the socket.

The dental wounds were also painted with the lymph gland extract several times daily. The treatment continued for fifty-five days with complete recovery.

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Enterotomy in a Dog

A male Foxhound, 5 years old, had eaten a large quantity of beef bones, and had subsequently strained without being able to defecate. The owner had administered mineral oil, castor oil, epsom salts, and sundry other laxatives without effect for a week.

Palpation revealed a hard, sausage-shaped mass in the rectum, and another large mass on the floor of the abdomen. Soapy enemas were immediately begun and continued intermittently for a week, when, with the aid of forceps the rectum and posterior portion of the colon were cleared; but the impacted mass on the floor of the abdomen had failed to change position. Strangely, the material removed contained no bones, but was putty-like and emitted an odor like that coming from a sewer or septic tank. Laxatives given between enemas had no apparent effect. It was believed that the colon had become atonic and that surgery was definitely indicated.

With the owner fully realizing the risk of such an operation, laparotomy was performed under morphine-nembutal anesthesia, and through a 4-in. incision, beginning just anterior to the prepuce, the impacted colon was exposed. A longitudinal incision was made through all coats. The impacted material—similar in character to that removed by enema—was squeezed and "milked" from adjacent sections of the colon. A second incision was necessary to remove the most distant impacted mass, which had resisted milking toward the first incision. The bowel surface was then wiped clean with sterile moistened cotton, a double row of Cushing right angle sutures (00 chromic catgut) placed in each incision—as we do when closing the uterus after cesarean section—the colon and abdominal cavity dusted well with sterile sulfanilamide crystals, and the colon returned to its original position. Interrupted chromic catgut sutures were then placed through peritoneum and muscle, and interrupted silkworm gut through the skin. Before awakening, the dog was given 300,000 units of penicillin in oil-wax intramuscularly.

The next morning the patient was weak but drank a milk-karo mixture. He was then placed on sulfamethazine in adequate dosage for the next three days, along with amino acids and vitamin B tonic *per os*, in an attempt to tone up the bowel musculature and supply a readily assimilable type of protein, as well as minimize the danger of peritonitis through possible leakage of intestinal contents.

Apparently this regimen was rational, for at no time following surgery did the temperature rise, and the dog's appetite and strength increased daily. He was discharged from the hospital ten days following the operation, and vitamin B liver capsules dispensed, to be given for two weeks. His stools, pasty at first, were becoming more formed, and no severe straining was noted. He was now on a full diet.

Though the case outlined may easily be the one "that got well," it suggests strongly that one should not hesitate to take this long chance of saving the patient's life when other attempts to remove impactions have failed. If the owner is properly prepared, an unsuccessful outcome is accepted with no hard feelings, while a successful outcome is a good practice-builder, not to mention the feeling of accomplishment it gives to the operator.—*M. J. Eggert, D.V.M., Rio Road, Route 2, Charlottesville, Va.*

Penicillin and Sulfonamides Not Effective in Typhoid Fever.—Critical trials of penicillin and sulfonamides carried out in British military hospitals in Egypt and Iraq are reported in *Lancet* (Apr. 3, 1948) as "disappointing." Besides, the repeated injections which were required interfered with the patients' rest. Penicillin in doses of 600,000 units combined with 1.5 Gm. of sulfathiazole injected every three hours did not change the course of the disease.

NUTRITION

Cobalt in Animal Nutrition

The Nutrition Committee, Dr. C. C. Hastings, chairman, presents summaries of the more important contributions of the past year, to its knowledge, of the value of cobalt in animal nutrition. The abstracts were prepared by Dr. Jesse Sampson, Urbana, Ill., a member of the Committee.—The Editors.

Cobalt Deficient Areas.—Additional reports of cobalt deficient areas, notably in Wisconsin, Michigan, New Hampshire, and North Carolina, and also in the British Isles and Scotland, have stimulated increased interest in this element which, strangely, appears to be required by ruminants only.

The partition of radiocative cobalt by cows with rumen fistulas was studied. Intravenously injected, labeled cobalt was excreted chiefly in the urine. Approximately 7 per cent appeared in the feces and none was found in the rumen. On the other hand, labeled cobalt introduced directly into the rumen was excreted chiefly in the feces and none was detected in the blood, milk, or saliva, indicating very poor absorption of the element. The elimination of labeled cobalt in the pancreatic juice and the bile of dogs was studied. Significant amounts of intravenously injected cobalt were not found in the pancreatic juice but a total of 5 per cent was eliminated by way of the bile.

The apparent nonrequirement of cobalt by simple-stomached animals has been very puzzling, although recent work tends to support the idea.

Rats fed a diet extremely low (0.003 p.p.m.) in cobalt exhibited no evidence of any need. Rabbits fed a diet containing 0.0024 p.p.m. of cobalt gave no evidence of a deficiency.

In a study of New Zealand pastures, no relationship was found between the cobalt content and the rate of growth of the pasture. On the Coastal Plain of North Carolina, a seasonal difference was noted in the cobalt content of a reed which is widely consumed by grazing cattle. This research presents evidence, based on forage analyses, that cobalt may be deficient in many areas in the Atlantic Coastal Plain.

Further data have been published on the polycythemia induced by feeding cobalt salts. A new very sensitive method of determining cobalt in biologic materials is described on page 91.—*Luck, J. M., Loring, H. S., and Mackinney, Gordon: Annual Review of Biochemistry. Annual Reviews, Inc., Stanford University P. O., California, 26, 1947:280-281.*

Cobalt Deficiency and Anemia.—Recent evidence shows that another mineral is essential for the prevention of progressive emaciation and anemia, at least in some species of animals. It is cobalt. There occurs in Florida a nutritional anemia of cattle known as salt sick. Where cobalt is lacking in the forage, iron and copper are ineffective in curing the condition. Cobalt is also required. Evidence has recently been obtained of a cobalt deficiency in cattle in parts of Michigan, Wisconsin, New Hampshire, North Carolina, and New York. Diseases of ruminants in Australia, New Zealand, and other parts of the world due to cobalt deficiency have been reported.

Cobalt exerts a favorable effect on hematopoiesis in some dogs on a milk diet with iron and copper. Other dogs on the same diet may show no stimulation of hematopoiesis when cobalt is administered.

Cobalt excretion from the body has been studied by the use of radioactive cobalt. When cobalt is introduced parenterally into the body, the chief path of its excretion is the urine. Much smaller amounts are eliminated in the feces. When given by mouth, much of the cobalt is unabsorbed, as is indicated by the appearance of a large proportion of the element in the feces.—*Dukes, H. H.: The Physiology of Domestic Animals. 6th edition. Comstock Publishing Company, Inc., New York. 1947:512-513.*

Cobalt Studies with the Rabbit. — In earlier studies with the white rat, it was not possible to produce evidence of a cobalt deficiency when as little as 0.6 μg. of cobalt was ingested daily per rat (*J. Biol. Chem., 124,* (1938) :429). Later (*Nutr. Rev., 4,* (1946) :336) no evidence was found of cobalt deficiency in the rat when a basal ration supplying only 0.03 μg. of cobalt per rat per day was fed.

Rabbits were fed a diet composed of whole milk collected at milking in Pyrex jars and corn grown in a low cobalt area (*J. Nutr., 34,* (1947) :121). In the ration of these two foods consumed by the rabbits, the cobalt content of the diet on a dry weight basis was 0.0024 parts per million. From birth to 4 weeks of age, the rabbits were not allowed access to the dam's ration. At 4 weeks of age, they were divided into groups at random; 15 of the rabbits received no cobalt supplement, while 5 received an additional 4 μg. of cobalt per day. Five animals in the first group and all 5 in the second group were given supplements of iron, copper, and manganese, while the remaining 10 were given a supplement of manganese only. After 14 weeks of age, these animals also were given supplements of iron and copper. The average hemoglobin values from this point to the end of the experiment were 12 Gm./100 cc. of blood for the group receiving cobalt and 12.6 Gm./100 cc. of blood for the group not receiving cobalt.

The rate of growth in both groups was fairly good, but the mortality during the experiment was high with only 10 survivors at the end of the 46-week experimental period. The rate of growth was slightly more rapid, and the mortality slightly lower in the cobalt-supplemented group. The consumption of corn and of milk was slightly higher for the rabbits receiving the cobalt supplements. None of these differences were sufficiently great to be of statistical significance. At autopsy of the rabbits which survived the entire experimental period, the livers of the cobalt-supplemented rabbits were found to contain 0.140 μg. of cobalt/Gm. in contrast to 0.014 μg. in the livers of those rabbits with no cobalt supplement. All animals appeared normal with the exception that the livers of nearly all animals in both groups were cirrhotic. This finding, along with the high mortality and the inability of females to raise their young, indicated the gross inadequacy of the diet in other respects than its iron, copper, manganese, and cobalt contents. Supplemental feeding of sodium chloride, thiamin, and cellulose had been demonstrated to be ineffective.

It is unknown whether the other nutritional deficiencies of this diet could have influenced the production of a cobalt deficiency in these animals. So far as these experimental data go, they substantiate the present evidence that there is a difference in the cobalt requirement of ruminating and nonruminating animals.

On the basis of evidence described (*Ann. Rev. Biochem., 13,* (1944) :315) *i.e.,* that sheep suffering from cobalt deficiency were cured when cobalt was given orally but were not cured when cobalt was injected, Thompson and Ellis have presented the interesting postulate that cobalt may be essential for some of the microörganisms in the rumen which are concerned with the synthesis of B vitamins. The latter investigators drew attention to certain similarities between cobalt deficiency in sheep and cattle and experimental deficiencies of some members of the vitamin B complex: anorexia, impaired reproduction, and hypochromic microcytic anemia. While none of these deficiency signs is specific to any particular deficiency, the similarity is an interesting one, especially since J. F. Filmer (*Austral. Vet. J., 9,* (1933) :163) demonstrated that liver was effective in curing endemic "coast disease" and that liver ash was ineffective.—*Nutrition Reviews, 6, (March, 1948) :73, 74.*

Irish potatoes are reported to make a palatable and acceptable beef-steer feed if chopped into small pieces, salted, and soaked in molasses water.—*Certified Milk, Feb., 1948.*

It is possible that low blood magnesium is normal for animals, especially beef breeding cows, wintered in the open under certain climatic conditions, as in the bluegrass region.—*Dr. Robert H. Udall, Kentucky.*

Deficiency of vitamin C may cause a change in the alveolar bones of animals.—*Am. Druggist, May, 1948.*

Mechanism of Cobalt Deficiency

Ray *et al.* at the University of Wisconsin showed that thiamin injection had a beneficial effect on the course of cobalt deficiency in ruminants. This suggested that a lack of cobalt does not directly cause deficiency symptoms but, rather, that the deficiency inactivates certain kinds of microflora responsible for the synthesis of certain B vitamins.

In further studies (*J. Nutr.*, Nov. 10, 1947), they showed that the blood levels of nicotinic acid, of the vitamin B_6 group, and probably of riboflavin, were lowered in sheep during cobalt deficiency, although apparently the levels of other B vitamins remained normal. This finding added weight to the theory that specific B vitamin deficiencies develop when cobalt is not present to stimulate their synthesis.

Further support is found in the results of previous investigators, including Thompson and Ellis (JOURNAL, Dec., 1947: 513), who observed that likewise the symptoms of cobalt deficiency are the symptoms of some B vitamin deficiencies, such as anorexia (thiamin), hypochromic microcytic anemia, and impaired reproduction (pyridoxin).

Resistance to Vitamin D

Fragile bones can be caused by (1) lack of vitamin D, (2) altered metabolism of calcium and phosphorus, (3) hyperparathyroidism, (4) kidney disease, and (5) resistance to vitamin D. The type of osteomalacia associated with steatorrhea, which is failure to assimilate fat, responds to moderate doses of vitamin D, but the type that is due to resistance to vitamin D requires massive doses. A boy of 16 suffering from rickets since 1 year of age did not respond to 1,100 units of vitamin D (U.S.P.) daily for ten years but yielded promptly to daily doses of 150,000 to 1,500,000 units daily by mouth. It was concluded that the failure to respond to smaller doses was due to an intrinsic resistance to the action of vitamin D—resistance which could be broken down by massive doses.

In feed value, 100 lb. of potatoes equals 100 lb. of corn silage, 22 lb. of shelled corn, or 35 lb. of alfalfa hay.—*USDA.*

"Animal Protein Factor" May Be Newly Isolated Vitamin B_{12}

The much discussed "animal protein factor" and the newly isolated vitamin B_{12} which is contained in liver may be identical, the American Chemical Society was told at its Chicago meeting in April. According to Dr. S. Ansbacher, of Indiana, the animal protein factor can be produced artificially through the use of bacteria, and large-scale commercial production is planned. The artificial product is said to speed animal growth almost as much as the substance found in liver and more than the animal protein factor recovered from fishmeal and manure.

Preliminary reports on the isolation of vitamin B_{12} (*Science*, Apr. 16, 1948: 396-398) stated that this substance produced positive hematologic responses in limited tests on patients with addisonian pernicious anemia, but the reports gave no indication of a relationship or identity of this vitamin fraction to the animal protein factor.

Sweet Potatoes vs. Corn in Rations for Dairy Cows

Studies by the dairy department of the University of Georgia revealed no significant differences between milk output, butterfat production, and body weight of cows fed ground, snapped white corn and those fed sweet potato meal, in amounts equal to 36 per cent of the concentrate mixture. Palatability of the two components was apparently identical, and the potato meal did not have an "objectionable laxative effect." In fact, the only significant difference was that the potato-fed cows had sleeker, brighter coats.

Regarding the conflicting reports as to the palatability of sweet potato meal, the authors explained that it is a relatively new product not yet standardized as to quality and that, moreover, much depends upon its proportion to other ingredients in the ration.—*J. Dairy Sci., 31, (May, 1948): 341-346.*

Investigators have observed that after cows ingest large amounts of synthetic riboflavin, their milk assumes a greenish-yellow color characteristic of aqueous solutions of this vitamin.

EDITORIAL

Zoötechnics

Properly defined, zoötechnics is the sum of knowledge on the use of animals for the benefit of mankind.

At different times, far-seeing leaders have proposed that the work of the veterinary profession be called *animal engineering* of which animal pathology is but a branch. The implication was that veterinary medicine is not limited to the treatment of ailing livestock, but is a branch of learning having many ramifications that ought to be more profoundly studied on the way to the D.V.M.

Webster does not include *zoötechnics* in the regular vocabulary but does define *zoötechnic* (adj.) as "pertaining to the use of animals." Unlike mathematics, economics, linguistics, physics, etc., the word is not used substantively except in veterinary literature. It, therefore, remains for the veterinary *raconteur* to go on using the word in the hope that the dictionaries will catch its full meaning. Notwithstanding that the improvement of breeds for special duties and their management for maximum productivity is a major chapter of zoötechnics, the full study covers a lot of ground that is by-passed in the orthodox veterinary training. How much should one know about everything animals do and how to rig them up to do it and what they produce in power, speed, sport, pastime, scientific research, food, wool, furs, hides, serums, vaccines, and numerous other gifts to mankind? "As much as necessary to score above the level of total ignorance" appears to be the right answer.

"The use of animals for the benefit of mankind" is not all beautiful. Zoötechnics has sad, tragic, and ugly facets which the veterinarian has to confront in the line of duty. Some of its operations are best kept in the background to spare the human conscience, like the drama staged in the best-regulated slaughterhouse so that man may have meat. Some are strange contrasts — like the barefoot boy's devotion to his mongrel dog and the sweet teen-ager who sees her prize-winning prodigy go to the knacker without batting an eye. Or compare the wholesale suffering of commercialized quackery among the helpless providers of human subsistence with the classical type of clinical work.

The sledge dog of the Arctic, the elephant of the tropics, the draft horse and ox and caribao, the ships of the desert, the mounts of the army and ranch and turf and bridle-path, the dogs and game of the sportsman, the feathered and the fleecy flocks, the swine herds, the wildlife captured and nursed for exhibition, and the experimental animals of the laboratory are the groupings of higher life that make up the scope of zoötechnics. Absurd as it would be to crave expertness in the whole complex, a general knowledge of the use man makes of animals and animal products in every estate and place has considerable virtue.

Take the troubled field of animal experimentation, where the thesis would seem to be torn between devotion to animals on the one hand and dependence upon the advancement of science on the other, the summary shows that man took over the captaincy of the animal kingdom by the teachings of zoötechnics—*the use of animals for the benefit of mankind.*

The Horse Situation of Great Britain

The *Veterinary Journal*, London, writes a sorrowful tale about the vanishing horse-breeding industry in respect to its effects on British economy as a whole and its agriculture in particular. The Shire Horse Society reports a 20 per cent decline in the number of horses during the period 1935-1946 and attributes the cause to the increase in arable land, the urge for more production with less manpower, and the

demand for horse meat in domestic and foreign trade. Of the 16,000 foals born in 1946, 2,400 were slaughtered for meat before they had worn harness. If that state of affairs continues, the editor declares, the horse industry is doomed to extinction along with the wheelwrights, farriers, saddlers, feed merchants, and the rural veterinarians, not to mention a sizable overseas market for purebred stock that won fame through the years for the horse lovers and horsemen of England and Scotland. That horsepower reproduces itself, brings income from animals sold, helps to maintain soil fertility, and can do any farm job better than mechanical power are stressed in the arguments set forth in behalf of retaining the farm horse.

The forceful way in which the mental reaction to the threatened extinction of the horse industry is told is as understandable as the truth of the story itself, but, in countries like the U. S. A. where agriculture reigns, the personnel hinged to the use of horsepower on the farms has been so long inured to the tragic trend that attempts to reverse it seem as futile as whacking the bare knuckles against a stone wall. There are more maws to fill from a cruelly fixed acreage and that's that. The most generous devotion to the farm horse and the soundest arguments in its behalf on economic grounds must yield to the cry of Oliver Twist.

Dicumarol Poisoning

Dicumarol is best known in veterinary medicine as the active principle of spoiled sweet clover hay and for its dire effects on livestock. It has reached the self-medication stage in human medicine, seemingly, to such an extent that Dr. Arthur Draper (*J.Am.M.A.*, Jan. 17, 1948) warns the laity against its indiscriminate use. The hemorrhagic diathesis, common in cattle, followed its use by a nurse of 46. Noting the touting of dicumarol in the newspapers as a cure for arthritis, the nurse overdosed herself. The symptoms were about what one would see in a sweet-clover-poisoned steer: bloody urine, bloody stools, oozing gums, and swelling over the trunk, thighs, buttocks, face, and arms, with ecchymoses on the swollen places. The attack lasted eight days. She was treated with vitamin K.

Cassius Way, B.Agr., B.A., D.V.M.
1881-1948

Dispatches announcing the sudden death of Past-President Way, by accident on the line of duty, August 5, came as a heart-breaking shock while this issue was going to press and, therefore too late to write a fitting obituary of one of the profession's most capable executives and active members during the last forty years. A suitable biography will be prepared for the October issue.

Dr. Cassius Way

The Mode of Action of Penicillin

The early English workers reported that penicillin exerted a bacteriostatic action rather than a bactericidal one and that, by so doing, it aided the body processes by permitting them to concentrate on the smaller number of organisms present. They based this statement on numerous observations which showed that varying concentrations of penicillin exerted partial or total inhibitory action on a number of organisms, and after assessing results on the basis of total organism count. They discarded the idea that a variation in cell susceptibility might be a factor in determining the difference in total count. All of this work was done with low concentrations of penicillin (less than 1 Florey or Oxford unit per cc.) and *in vitro*.

As the work progressed, and assay methods were improved, a technique was developed for making counts of viable organisms. This enabled workers to study the

factors which influenced the persistence and the multiplication of live bacteria. It also clarified some results which previously had been interpreted in contradictory ways by different observers.

Among the factors found to influence the number of viable organisms present after exposure to a fixed or a variable concentration of penicillin are: the enrichment of the medium, the dilution of the medium, the temperature of storage, the incubating temperature, the age of the culture before addition of penicillin, the nature of the organism, and the concentration of penicillin.

It has been found, on the basis of numerous trials, that any factor which stimulates the rate of growth and the multiplication of the organisms makes it more susceptible to the action of penicillin. Thus, the enrichment of the medium, the increase of the incubating temperature, and the use of young and active cultures results in a greater bactericidal action of a given concentration of penicillin. On the other hand, the dilution of the medium, a reduction in the temperature of incubation or storage, and the use of cultures twenty-four or more hours old resulted in survival of a greater percentage of the viable organisms originally present—unless the period of contact was lengthened to permit a greater degree of growth and multiplication.

From this work, *in vitro*, it seems likely that a given concentration of penicillin will kill growing organisms of a given type in a certain length of time. Anything which may increase the rate of multiplication will tend to shorten the time needed to kill the organisms, while anything that decreases the rate of growth will require the time of contact to be longer, or the concentration of penicillin to be higher in order to secure an equal bactericidal effect.

The logarithmic computation of the results of experiments along this line indicate that a fraction of each generation is killed, and that the same factors which have already been enumerated in determining the susceptibility of the organism will also help to determine the fraction of organisms killed in each generation.

Of the four types of penicillin now recognized, penicillin G is considered the best one available to practitioners, while type K is the least effective because it is unstable and is quickly eliminated from the body. Of the penicillin salts available for clinical use, potassium penicillin is the product of greatest value. It remains active without refrigeration so long as it is in crystalline form, but must be refrigerated after being put into solution. It is reported that 85 per cent of a group of human cases had assayable levels of penicillin remaining in the blood approximately twenty-four hours after a single injection, and the remaining patients maintained assayable penicillin levels for sixteen hours or longer.

The average adequate blood level of penicillin is 0.15 units per cubic centimeter, but accurate bacteriologic diagnosis is imperative because this figure varies within wide limits for the various organisms. No quick, chemical test for this level is available, but bacteriologic methods are used by most laboratories, even though somewhat complicated.

Penicillin must be used as adjuvant treatment in most infectious processes; it does not supplant other sound therapeutic and hygienic procedures. Combined with surgery, with sulfonamide therapy, with biologic injections, or with a strict sanitary program, it will yield more satisfactory results than the older treatment alone, but when used without the other rational treatment it may give disappointingly poor results. Bacterial resistance to penicillin can be developed, but is not a major factor, if adequate rather than minimal doses are used.

The period of assayable blood penicillin has been considered the most important factor in determining the frequency of injection. This has varied with the type of penicillin used, with the type of solvent or vehicle, and the rate of elimination. As already indicated, penicillin G is considered the best type available to practitioners. This statement may be subject to revision as additional evidence accumulates on the use of procaine penicillin. This is a distinct chemical compound, and its properties and actions are being studied. Preliminary reports are highly encouraging.

Revision may also be necessary as we learn more about the action of penicillin within the tissues of the body. There is evidence to indicate that in certain types of medication there is saturation of the tissues with the medicament, so that the effect is prolonged into the period when detectable amounts are no longer present in the circulating blood.

Extensive experimentation has been car-

ried on to find a vehicle which will promote a longer active period, that is, a greater spread from the time of effective absorption to the time of complete elimination. It is apparent that these solvents or vehicles may operate in one or more of several ways: by reducing the rate of absorption, by increasing the degree of dispersion, and by slowing the rate of excretion. Solutions of penicillin in distilled water, or in physiological saline solution, are rapidly absorbed and rapidly excreted. Solutions in oil, or in oil-and-wax, are absorbed more slowly; but any slowing in rate of excretion is apparently traceable to the decreased rate of absorption.

Attempts to retard excretion have centered around a method of binding it with a substance not readily excreted or of interfering with the ability of the kidney tubules to excrete penicillin but not other important waste products. The latter has been accomplished to a degree. It has been learned that a substance called caronamide can be ingested and then rapidly absorbed. In the blood stream, this substance is carried to the kidney tubules where it interferes with the enzyme system responsible for the elimination of penicillin—but apparently not with ony other important waste product. Additional work on this and other substances is under way, and it seems likely that additional progress will be reported at intervals.

One other item that will bear watching is the radioactive penicillin. Grown on, or in, a radioactive medium, the penicillin itself becomes radioactive. As yet, there has been little evidence of any practical use for this substance, but the possibility should not be ignored.

Sludged Blood in Pathology

New studies of blood cells while coursing in the peripheral vessels of tissues undergoing the pathologic changes of general or local disease give new importance to the concentration of blood cells (sludging) as the blood is streaming swiftly from the arterial to the venous circulation through the capillary system, that is, from the arteriole-to-capillary or sinusoid-to-venule as the case may be. Cinematographic records made under a magnification of 16 to 600 times with the aid of transillumination, show the rate of flow and the behavior of the blood and of the vessels. The blood flowed so swiftly in the arterioles and venules (60 to 120 μ in diameter) of normal tissues and organs that the cells could not be seen, nor could the blood be seen to lose any of its fluid. In a large number of sick animals and persons examined many of the arterioles were found to be plugged with sludge, temporarily or permanently. In all severely sick, and in all types of pathologic tissues, agglutinated clumps of red cells were seen sticking to the lining of the vessels along with circulating masses of both white and red cells which plugged the small arterioles. In the severely ill, agglutinated blood and visible pathologic changes in the vessel walls were observed. To be remembered is that these phenomena were seen in tuberculosis, leptospirosis, leucemia, whooping cough, typhus, tularemia, typhoid fever, smallpox, and others.

The problem posed by these significant observations is the amount of damage sludged blood inflicts in the course of illness and the obvious importance of keeping the blood fluid and thus prevent the sludging that appears to be a part of so many pathologic processes. In the light of this research, some physicians have suggested that the anticoagulants, heparin and dicumarol, may have a wide range of indications in daily practice. This phase remains highly experimental.

Editorial: "Sludged Blood," J.Am.M.A. (Feb. 21, 1948): 556-557.

Officers Elected at San Francisco

According to a dispatch received from the AVMA meeting as the JOURNAL was going to press, the following officers were elected at San Francisco.

C. P. Zepp, Sr., New York, N. Y., *president-elect.*

General J. A. McCallam, Washington, D.C., *first vice-president.*

R. C. Dunn, College Station, Texas, *second vice-president.*

R. S. Sugg, Auburn, Ala., *third vice-president.*

E. F. Johnston, Carp, Ont., *fourth vice-president.*

L. J. Goss, New York, N. Y., *fifth vice-president.*

W. A. Young, Chicago, was reëlected *treasurer.*

CURRENT LITERATURE

ABSTRACTS

Wheat Tetany in Cattle

Cattle grazing wheat may develop tetany. Blood analysis shows that this condition is accompanied by a low serum calcium content. By experimental means, the blood calcium can be lowered while the blood potassium is raised, with appearance of symptoms very similar to those of wheat tetany. Tetany can also be induced by elevating the potassium without depressing the calcium. The tetany so produced is more spectacular but somewhat transitory. This would indicate that the ratio of potassium to ionized calcium is more important than the ratio of potassium to total calcium. Exercise induces a temporary rise in blood potassium in some animals, and may be a factor in causing tetany. Intravenous administration of calcium salts helps to reëstablish the potassium-calcium balance of the blood and so correct the trouble. —[*J. Dennis and F. G. Harbaugh: Blood Potassium and Calcium Levels in Cattle. Am. J. Vet. Res., 9, (Jan., 1948): 20-25.*]

Coccidiosis Medication

Sulfaquinoxaline is an effective therapeutic agent against cecal coccidiosis in the chicken, when the drug intake is at the rate of about 1 gr./lb. of body weight per day. This rate of medication can be achieved by adding it to the drinking water at the rate of 0.04 per cent. It appears to be effective against every stage in the life cycle of *Eimeria tenella*.—[*E. H. Peterson: The Effect of Sulfaquinoxaline Medication on Eimeria Tenella Infection in Chickens. Am. J. Vet. Res., 9, (Jan., 1948): 77-84.*]

Swine Brucellosis Titers

Five brucellosis-free herds of swine have been studied in detail with particular reference to the reproductive performances for periods of two to four years. The results suggest that in clean herds there are no important differences in the number of pigs born living and the number born dead when both parents are negative to the agglutination test in all dilutions, when one parent is negative and the other parent positive in one or both serum dilutions, or when both parents are positive. However, absence of comparable records on the livability of pigs born to reactor sows in herds considered brucellosis-infected is indicated by the authors.

It is believed that a herd can be considered brucellosis-free if two successive agglutination tests sixty days apart on all breeding stock do not disclose titers of 1:100 or higher, and no new animals have been introduced into the herd within thirty days preceding the first test. Additions should pass a negative test at time of purchase, be kept in strict isolation for sixty days, and then pass a second negative test before being added to the herd.—[*H. C. H. Kernkamp and M. H. Roepke: Interpretation of Low Agglutination Titers in the Control of Swine Brucellosis. Am. J. Vet. Res., 9, (Jan., 1948): 46-49.*]

Medical Aspects of Government Services in Time of National Emergency

Purely medical problems are seldom peculiar to a government service, and the solution of medical problems by all government services in national emergencies is conditioned by factors influenced by the civil organizations of the medical professions. The selection of personnel to be trained, their education, their philosophies, and their qualifications and capacities are all products solely of civilians long before any government medical personnel have ever taken office.

The additional Army personnel required at any time might be provided most simply if: (1) some equitable allocation of all personnel to all purposes in the nation were to be predetermined by an authorized and qualified agency to be made available on call; (2) all personnel were to be registered and classified by some system similar to the Army Classification System, the job specifications of which had been successfully applied for several years; (3) all personnel were called solely in priorities and for purposes suitable to their classifications; (4) medical education were continued and not reduced, with all related sciences likewise assured; and (5) the military medical professional training program were maintained at maximum levels. The first four of these are beyond the control of the Army.

Veterinary problems presented are: (1) insufficient numbers of veterinarians to continue minimum essential functions; (2) the continuance of veterinary education in wartime; (3) the possibility of attack against animal populations, making the civilian veterinarians more important than the military for actual survi-

val; and (4) food inspections complicated by radiation, shortages, rationing, and conservation.

The Council on National Emergency Medical Service can contribute marked benefits to the Army by profound observance of a need for balancing all medical resources with all medical needs in a national emergency, while preserving maximum personal liberty and individual freedom of action compatible with the good of the whole population established within an orderly pattern.—[*W. L. Wilson, Bull. U. S. Army Med. Dept. VIII, No. 7, (July, 1948):493-498.*]

Bovine Tuberculosis in Poland

Due to the inadequate care exhibited by the tuberculin-producing companies, not only did the brands of tuberculin differ in their activity, but even brands of the same company did not always give the same results. In order to avoid confusion, mallein was used to discover nonspecific components of the tuberculin reaction. The necessity of a high standard tuberculin preparation in testing tuberculosis is stressed.—[*Epizoötiological Observations on Bovine Tuberculosis in Poland with Particular Consideration of the Intradermal Tuberculin Test. Medycyna Weterynaryjna, 3, (1947): 559-564.*]—L.I.H.

Volume Changes in Bovine Teat

A plethysmograph was constructed with a glass tube conforming in length and diameter to the teat. To the narrow lower end of the glass tube was attached a rubber tube leading to a Marey tambour. The apparatus was secured to the base of the teat by a rubber suction ring surrounding the glass chamber and connected to a vacuum pump. Twenty-five cows were examined.

Intravenous injection of posterior pituitary extract caused a marked increase in the volume of the teat when the milk was forced down. After milking completely, posterior pituitary extract produced much smaller changes in volume.

The teats of many normal cows, especially young animals, showed distinct rhythmic teat contractions when the udder was full. The teats became suddenly shorter, then slowly relaxed. Usually, one teat at a time was seen in contraction, which was indicated by temporary circular folds. Heifers, in which lactation had been induced with stilbestrol, exhibited more frequent and more intense contractions.

The apparatus was applied to one teat while two others were milked. Contractions became strong and regular as soon as the first streams of milk were drawn.

Adrenalin, intravenously, inhibited teat motility.

After milking, the udder was completely flaccid with no evidence of teat activity. Inflation of the udder initiated contractions.

Spontaneous rhythmic contractions were observed in two of four isolated and perfused udders.

The teat contractions were attributed to the response of the smooth muscle in the teat to the stimulus of mechanical stretching, caused by erection of the teat when the udder is filled with milk, or by the presence of milk in the teat during milking. In their discussion, the authors state that the teat volume is greater before milking than after; and this difference is not caused by the presence of milk in the teat cistern, but rather by a passive stasis of blood in the teat. The distention of the milk ducts compresses the veins so that the return of blood from the teat region is obstructed and the venous pressure in the teat rises. Thus the teat reaches a condition of erection which stretches the musculature and initiates contractions. The teat movements may be regarded as a pump mechanism by which the blood is propelled toward the heart from a dependent organ.

The lack of teat contractions in some old cows is attributed to fatigue and over-extension of the muscle fibers. Venous return is facilitated by marked development of superficial veins.

The increased activity of the teats of stilbestrol-treated heifers is said to be the result of sensitization of the smooth muscle, as in the case of the uterus. Stilbestrol also increases the blood supply to the udder by its vasodilator effect, augmenting teat erection and the stretch stimulus.—[*G. Peeters, L. Massart, W. Oyaert, and R. Coussens: Laboratory for Physiology, Pharmacology and Physiological Chemistry of Domestic Animals. Ghent: Volumewijzigingen der Rundertepels. Vlaams Diergeneeskundig Tijdschrift, 17, (May-June, 1948):59-68.*] *R. E. H.*

Vitamins for Calves

Forty-eight herds were classified into three groups: good, fair, or poor, according to the calf-feeding and management condition on each farm. Data were accumulated on 1,347 calves, and it was concluded that "the routine feeding of vitamin tablets to calves raised under New York conditions is not a panacea for calf ills and should not be recommended as a substitute for good feeding and management practices. It should not be inferred that the results reported preclude the possibility of specific vitamin or other nutritional deficiencies occurring in individual calves." The tablets fed contained 5,000 I.U. of vitamin A; 250 mg. of vitamin C; 1,000 U.S.P. units of vitamin D; and 100 mg. of niacin. The feeding of these tablets "did not materially reduce the incidence or duration of scours, nor was there any apparent improvement in the general appearance and condition

of the calves up to 30 days of age."—[*A. A. Spielman, D. B. H. Dalrymple, C. L. Norton, J. K. Loosli, and K. L. Turk: The Value of Supplementary Vitamins for Calves Raised Under Farm Conditions. Am. J. Vet. Res., 9, (Jan., 1948): 26-29.*]

Virus Susceptibility

Susceptibility to the virus of Carré is limited to species in the order of Carnivora. In the family Canidae, dogs, wolves, foxes, coyotes, and dingoes are known to be susceptible. In the family Mustelidae, skunks, ferrets, and mink can contract distemper. The other families subject to this virus are Procyonidae and Viverridae, each by a single member—the raccoon and the binturong (civet), respectively.

Susceptibility to feline enteritis (panleucopenia, agranulocytosis, cat distemper, infectious feline enteritis, etc.) is limited also to species of the order of Carnivora. All members of the family Felidae (cats, lions, tigers, leopards, etc.) are susceptible, and the only other animal is the raccoon.

The raccoon is unique in that it is the only animal known to be susceptible to both types of virus. An interesting parallel observation is that the bear family is the only descendant from Arctoidea that does not have at least one species susceptible to either of these two viruses.—[*L. J. Goss: Species Susceptibility to the Viruses of Carré and Feline Enteritis. Am. J. Vet. Res., 9, (Jan., 1948): 65-68.*]

Operation Hardware

This is the title of a feature article in *Country Gentleman* (July, 1948) which tells, with words and pictures, of the experience at Biltmore Dairy, Asheville, N. Car., with its herd of some 1,200 registered Jerseys.

Over a period of more than ten years, every animal that died at Biltmore was subjected to

"But have you heard about my operation?"

—*Courtesy Country Gentleman*

a careful postmorten examination by Dr. E. L. Shuford (KCVC '18). He found that half of the animals died of traumatic gastritis and its complications. Upon the basis of these figures, Dr. Shuford and his successor at Biltmore, Dr. A. B. Christian (CORN '39), were able to convince the farm manager that the best remedy was an immediate operation following an early diagnosis.

The herdsman can base his early diagnosis on three good indications: the patient is off feed, the milk production declines abruptly, and the attitude of the animal (when standing or walking) is stiff, awkward, and careful. The diagnosis is clinched by the veterinarian upon recognition of fever, elevated pulse and respiration, and a characteristic grunt when the region of the reticulum is percussed. This grunt can be detected readily by using the stethoscope over the trachea.

Of 20 cows upon which the exploratory rumenotomy was performed, 18 lived and made good recoveries. The author of the article, Arnold Nicholson, says: "Furthermore, both the diagnosis and the surgery are the sort of things that any competent veterinarian can readily learn to perform."—[*Arnold Nicholson: Operation Hardware. Country Gentleman, July, 1948:17.*]

Soviet Horse Breeding

This editorial is a demand for improved veterinary service to the horse industry. Horse production suffered more during the war than any other branch of animal husbandry. Many collective farms in the invaded areas are still without horses. Even at a high level of mechanization, animal draft plays, and will continue to play, an important part in conjunction with tractors and trucks.

The postwar five-year plan provides for an increase of the horse population to 12.9 million by Jan. 1, 1948. The usual compliments are paid to the republics and districts which have made good progress toward the goal (Kazak, Kirghiz, Kursk, Orlov). But other local agricultural administrations are severely criticized. Of the total incidence of disease in horses in 1947, 76 per cent of the cases were sporadic. Of these, 33.6 per cent were diseases of the limbs and mechanical injuries resulting from negligence; 28.8 per cent were digestive diseases from feeding errors; 10.2 per cent were respiratory diseases caused by unsatisfactory quarters and care. Several regions are mentioned in which only about 67 per cent of the mares were bred in 1947, and others in which only 48 per cent of the mares produced foals.

Although the incidence of infectious diseases was reduced 28.8 per cent in nine months of 1947, the incidence of sporadic diseases and the poor care of the sick continue to be serious defects of the veterinary service. It is absolutely intolerable that in the Georgian S.S.R., with a full complement of veterinary personnel and facilities, only 27 per cent of sick horses were treated. Mange of horses has not been com-

pletely eliminated in some areas. This disgraceful disease must be eliminated in the near future.

By order of the Ministry of Agriculture (Feb. 1, 1948), stallions on the collective farms must be culled, and those selected for breeding must be certified and registered. They should be well fed and not worked during the breeding season. Mares must be examined and conditioned for breeding. All possible measures will be taken to improve foaling conditions.

The nutritional conditioning of horses for the spring work is essential to the fulfillment of the goals set by the Central Committee of the Communist Party for increased sown acreage and yields.

Marshall S. M. Budenny is quoted in a speech urging horsemen to devote themselves without reserve to their business and to spread the love of horses among the "broad masses" of collective farmers.—[*Editorial: Improve the Veterinary Service in Horse Breeding. Veterinariya, 25, (Feb., 1948) 1:3.*]

Massage

The rationale in the use of massage and the technique used both in human beings and in animals is described. In animals, massage is recommended for the treatment of diseases of the muscles, tendons, joints, nerves, mouth, gastrointestinal tract, circulation, etc. Horses should receive a massage after hard work. Only veterinarians, trained in the technique of massage, should act as masseurs for animals.—[*The Use of Massage in the Treatment of Animals. Medycyna Weterynaryjna, 3, (1947): 571-578.*]—L.I.H.

BOOKS AND REPORTS

Veterinary Protozoölogy

This is the first book to come to our attention, which devotes its pages entirely to the protozoan diseases of the domestic animals of North America. It is meant to serve as a handbook for veterinary students, practicing veterinarians, and agricultural students. We believe that it fills the needs of the practicing veterinarian particularly well.

The text has been divided into a chapter of introductory and general information, and then successive chapters on the protozoa of horses, cattle, sheep and goats, swine, dogs and cats, poultry, and furbearing animals. There is, then, a summary chapter on the diagnostic techniques employed in routine examinations, and finally an appendix which lists 309 specific references, as well as books, bulletins, circulars, and journals in which articles of veterinary importance have been published.

This arrangement by species of animal makes it especially convenient for the practicing veterinarian to identify the problems he faces, and the 24 plates depict clearly and accurately more than 100 protozoan parasites of the common domestic animals. An excellent book for study, for reference, and for daily use.—[*Veterinary Protozoölogy. By Banner Bill Morgan and Philip A. Hawkins. 195 pages, cloth, illustrated. Burgess Publishing Co., 426 South Sixth Street, Minneapolis 15, Minn. 1948. Price $4.00.*]

Isotopes

A collection of papers on isotopes read before the Division of Biological Chemistry, American Chemical Society, at New York City in 1947, entitled "Preparation and Measurement of Isotopes and Some of Their Medical Aspects," deals with the difficult subject without entirely baffling the ordinary reader. It contains understandable material on the medicinal use of isotopes, with which the clinic must sooner or later cultivate a closer acquaintance.—*U. S. Gov. Printing Office, Washington, D. C. Price 35c.*

Physiology Manual

This student manual contains experiments for one academic year in the study of animal physiology. The experiments are designed to help the veterinary student develop a sound knowledge of the normal functions of the body organs and their relationships with one another. The pages are so designed that the student can devote a maximum of time to study and a minimum to the recording of essential data, and still have complete information available for review.

The subject matter is divided into the several organic systems, including the endocrine.—[*A Laboratory Manual of Physiology for Veterinary Students. By C. F. Cairy, Michigan State College, East Lansing. 191 pages, 8½ by 11," paper, spiral ring binder, pages perforated for transfer to looseleaf binder. Burgess Publishing Co., 426 South Sixth Street, Minneapolis 15, Minn.*]

Public Health Index

The *American Journal of Public Health* has just issued a thirty-five year index which presents a challenge to every other professional journal. Each such journal becomes a vast repository of valuable information in its own field, but the information remains essentially inaccessible because of the tedious task of thumbing through the index of each volume.

This index covers original papers, editorials, committee reports, and association matters, but does not include book reviews, abstracts, and similar short items. It is both an author and a title index, with a cross index on key words.

We commend the American Public Health Association and the editors for the courage to attempt the task, and for the tenacity to complete it and present a volume which makes all important subjects readily available for the use of students, authors, and clinicians.—*[Index Vol. 1-35, American Journal of Public Health and The Nation's Health. By Louise P. Tanner and Fred W. Tanner. 335 pages, cloth. The Garrard Press, 119-123 West Park Ave., Champaign, Ill. 1947.]*

Comparative Vertebrate Embryology

The author of this manual assumes that the reader has a basic knowledge of elementary biology and comparative vertebrate anatomy. The material is organized to serve the lecturer and the advanced student of laboratory embryology, *i.e.*: introduction summarizing the standard knowledge of the subject; lessons for laboratory study; references and hints on collateral reading; questions for review at the end of each chapter; and methods for obtaining living material for study, which is emphasized throughout the book as the preferable means of studying embryology. A fascinating feature describes the obtention of early stages of rabbit embryos for making vaginal smears for the study of estrous cycles. In the final chapter is a series of 300 photomicrographs setting apart, with explanatory legends, the precise material to be interpreted in the study of embryology in the laboratory.—*[A Laboratory Manual of Comparative Embryology. By Allyn Waterman. 248 pages. Illustrated. Henry Holt, New York. 1948. Price $3.50]*.

Selected Writings of Benjamin Rush

Native of the Quaker State, Benjamin Rush received his M.D. degree (Edinburgh University, 1768) at the very time veterinary schools were being established on the continent and two decades before there was any thought of formal veterinary education in Great Britain. Yet, on his return to Philadelphia, by re-creating the ancients' concept of veterinary-medical coöperation, he became the first known advocate of veterinary education in America. On the roster of famous American pioneers, the name Benjamin Rush (1745-1813) stands out among the names of the great men of modern times. He was surgeon general of the Continental Army; practitioner, teacher, and author; a signer of the Declaration of Independence; and cofounder of medical schools in America. The publication of a collection of his writings 123 years after his death is meaningful biography itself, but his life was not devoted to medicine alone. His activities embraced agriculture, chemistry, general education, theology, national politics, and public welfare. In this selection of his writing are discourses on Government, Education, Manners, Old Age, Duties of a Physician, Natural and Medical Sciences, The Bible as a School Book, Lectures on Animal Life; in all, 29 subjects which make up an assemblage of essays portraying a depth of mind and leadership that shape the destiny of coming generations, and to which time accords increasing greatness.

The fact that the veterinary curriculum he advocated was founded seventy-three years after his teachings (1885) is a bit of American veterinary history to keep alive, since few of his day took so broad a view of the medical sciences in their relation to human welfare. This book gives an insight into the status of medicine during the two decades overlapping the turn of the eighteenth century plus (between the lines) a perfect view of the tragic neglect of animal medicine, at that time.—*The Selected Writings of Benjamin Rush. By Dagobert D. Runes. 433 pages. Philosophical Library, New York City.* 1947. Price $5.00.

Hemostatic Agents

The study of the control of blood loss is not new. In very early times, it was realized that the flow of blood from vessels could be stopped by applying a ligature. It was also known that the application of heat reduced or stopped the flow of blood. The mechanism of clotting has been studied from many angles, since it becomes a factor in many fields of biology and medicine.

This book presents the information on hemostatic agents from the very early observations and theories down through the very newest materials developed from a knowledge of biochemistry and the mechanism by which blood clotting occurs. Much of this information has been available only in sources not readily accessible to practicing veterinarians. The authors have divided their material into six chapters under the titles: Clotting of Blood, Mechanics of Topical Hemostasis with Thrombin, Thrombin, Fibrinogen, Oxidized Cellulose, and Fibrin Foam and Gelatin Sponge.

The arrangement and the presentation is such that the veterinary surgeon will enjoy reading it, and will be able to improve his technique after he has studied it.—*[Hemostatic Agents. By W. H. Seegers, Ph.D., and E. A. Sharp, M. D., Wayne University, Detroit. 122 pages. 27 figures (some in color). 9 tables. 370 references. Cloth. Chas. C. Thomas, 301 East Lawrence Ave., Springfield, Ill. 1948. Price $4.50.]*

Bovine Tuberculosis

The author presents a vast amount of information and statistical data on the subject, together with some interesting discussion on the site of initial infection, the modes of spread within the body and to susceptible animals, the

pathogenicity, and the importance of congenital tuberculosis.

The information contained in the 21 tables is historically important, but requires study rather than casual reading. The 36 illustrations are helpful, but the author missed an opportunity to emphasize the value of eradication measures. He showed maps denoting the incidence of tuberculosis reactors in the United States in 1924 and 1934, but failed to complete the picture with another in 1944 when all counties had achieved a status of modified accredited area.

For the veterinarian in North America, the book dwells rather overlong on methods of control (as against eradication). On the other hand, it brings a realization of the importance of widespread tuberculosis to livestock and to human beings. For example, it is estimated that 20 per cent of the cattle of England are infected, and that 30 to 35 per cent of the dairy cattle are so diseased; and that 5 per cent of all human deaths from tuberculosis are of bovine origin, while 30 per cent of the deaths of tuberculous children under 5 years of age are of bovine origin.

The conclusion reached, after considering and presentng all of the evidence, is that "If we can continue to create attested herds at the same rate as in 1938-1939 we shall have practically eradicated tuberculosis within thirty or forty years."—[*Bovine Tuberculosis. By John Francis, Imperial Chemical Industries, Ltd., England. 220 pages. 5 x 8," 400 references. Staples Press, Ltd., Cavendish Place, London W 1, 1947. Price 25 shillings.*]

Science Service

This is the report of the director of the Dominion Department of Agriculture to the Minister of Agriculture, Ottawa, Canada. Veterinarians will be interested chiefly in the report from the Division of Animal Pathology, and this can be briefly told by quoting from the Highlights of the Year's Work. The following are some concise conclusions: (a) It has been confirmed that infectious mastitis may be treated successfully with penicillin; (b) vaccination of adult animals for brucellosis has not proved efficient; (c) a drug capable of successfully controlling cecal coccidiosis of chickens has been found; (d) the difficulties relating to the serologic diagnosis of pullorum disease, and consequently its control, have been overcome; (e) approximately 150,000 blood tests relating to the control of brucellosis have been made; (f) over 2,500,000 test doses of diagnostic agents have been distributed.

In discussing brucellosis, the report says, in part: "In general it may be said that the results indicate that vaccination of the calf induces a considerable degree of protection. This is to be distinguished, however, from complete immunity. Vaccination of adults is less effective, and apparently vaccination in the face of a 'storm' of abortion is useless. This indicates the necessity of using vaccination as a supplemental measure to existing controls with the purpose of finally eliminating the disease from the country."

The Division of Animal Pathology is composed of a central institute (Animal Diseases Research Institute) situated at Hull, Quebec, and four branch laboratories located at Saanichton, B. C.; Lethbridge, Alta.; MacDonald College, Que.; and at the Central Experiment Farm, Ottawa.—[*Science Service. Edited by K. W. Neatby, Director, Dominion Department of Agriculture, Ottawa, Can. Year ended March 31, 1947. 108 pages.*]

Ohio Conference

Ohio comes forth with another "first." This probably is not an original idea with the Ohio workers, but at least it marks the use of an excellent idea on an extensive scale. In connection with their conference of June 16 to 18, 1948, the Program Committee secured in advance copies of the papers to be presented, and they were mimeographed and ready for distribution at the close of the conference.

Having tried for some years to obtain advance copies of abstracts of papers to be delivered at AVMA conventions, we appreciate the work entailed in getting complete papers. Almost every program has a few speakers who would as willingly part with a right arm as file a 200-word abstract from which prospective convention-goers might judge the nature and the value of the paper.

We believe the Ohio plan is worthy of wider use, and welcome this help in impressing speakers with the importance of organizing their thoughts and setting them on paper for critical study before presentation of a paper.—[*Proceedings, Conference for Veterinarians, The Ohio State University. Mimeograph. 102 pages. June, 1948.*]—R. C. K.

The Onderstepoort Journal

This is essentially the annual report of the Director of Veterinary Services and Animal Industry. Its nine sections cover all fields of veterinary medicine from the basic sciences to the clinical aspects and control measures in the field. An attempt even to list the subjects discussed would be unduly long, and to enumerate only selected items would be neither fair nor helpful generally. We can only say that the compilation appears to cover every livestock problem of the Union of South Africa, and suggest that the interested student examine a copy at his nearest library.—[*Onderstepoort Journal of Veterinary Science and Animal Industry. Vol. 23. No. 1 and 2, March, 1948. Edited by P. J. du Toit, Director. 409 pages, maps, tables, illustrations, paper. Government printer, Pretoria. 1948. Price 5'.*]

THE NEWS

Notable Event of American Veterinary History

On July 5 to 9, provincial and dominion functionaries of Canada, federal and state officials of the U. S. A., educational executives, teachers, newsmen and editors, radio commentators, public health officers, laboratorians, and distinguished veterinarians from far and near

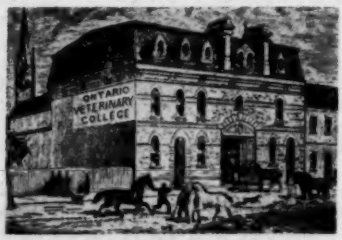

Fig. 1—Ontario Veterinary College in 1869.

journeyed to the luxurious campus of the agricultural college at Guelph to dedicate an expansion of America's oldest college of veterinary medicine—the Ontario Veterinary College, University of Toronto, established eighty-six years ago in the Canadian metropolis. Although ostensibly intended as a happy family reunion, the far-flung affluence and the admirers of the old school made the occasion a veritable exposition of America's veterinary service as of the middle of the twentieth century. The dedication, in fact, was a red-letter hour in the history of veterinary medicine in North America, carried out with calm dignity and completeness by the proud Ontario faculty, under the guidance of its talented chief, Principal Andrew L. MacNabb, whose predecessors through the years were: Andrew Smith (1862-1908), A. A. E. Grange (1908-1918), C. D. McGilvray (1918-1944).

It all started in 1861 when the Upper Canada (=Ontario) Board of Agriculture persuaded the University of Toronto to send an emissary to Scotland in search of a man capable of conducting a college of veterinary medicine in Toronto, such as there was in Edinburgh. The emissary was Prof. Geo. Buckland to whom Professor Dick of the Edinburgh Veterinary College recommended Andrew Smith, an honor graduate, for the experimental mission, *dites* experimental because, up to that time, all attempts to establish veterinary schools on this continent had been abortive. Yet, forthwith came Andrew Smith to make Canada the testing ground of formal veterinary education in the New World. The *dénouement* was America's first viable college of veterinary medicine—an institution with a university background and atmosphere from the start that has never been surrendered to ulterior motive or management, a school of far-reaching patronage in Canada that was destined also to provide the vanguard of a veterinary profession in the United States.

The advancement of veterinary medicine in the Western Hemisphere is depicted by the housing of the O. V. C. After seven years of lecturing in an agricultural hall at Queen and Yonge streets, the first exclusively veterinary-college building was erected on Temperance street in 1869 to provide accomodations to the growing patronage (see fig. 1). In a short five years, the hegira to Toronto to acquire the basis of a training in veterinary medicine was overcrowding this architectural classic to such

Fig. 2 — Ontario Veterinary College in 1889, 1908, and 1922.

Fig. 3—Dr. James Farquharson, one of the important clinicians at the meeting.

Fig. 4—Principal A. L. MacNabb.

Fig. 5—Representing 163 years of continuous veterinary service: W. J. R. Fowler (ONT '99), T. H. Ferguson (ONT '96), L. A. Merillat (ONT. '88).

Fig. 6—Hands across the boundary. W. A. Hagan (left), dean, New York State Veterinary College, and Andrew L. MacNabb, principal, Ontario Veterinary College, July 5, 1948.

Photographs for fig. 4, 5, 6, 7, and 8 were supplied by the Ontario Agricultural College.

Fig. 7—The Ontario Veterinary College in 1948, with Principal MacNabb's residence at the right.

a degree that adjacent halls had to be rented to seat the students. The next fifteen years saw the enrollment grow to such numbers (*e.g.*, 300 in 1885) that a four-story addition with ample classrooms and modern laboratories was constructed in 1889, making, by all counts, the most commodious and best equipped veterinary college building in English-speaking countries as of that date and for some years to come. The next building was built in 1908 on the campus of the University of Toronto on University avenue, after the college had been turned over to the Province of Ontario under a legislative act. It must always stand to the credit of Professor Smith that he did not profit by the transaction but rather donated the monument he had built to his government more in the form of a permanent foundation than in the guise of a personal bargain. The building on University avenue was a mistake. Its occupancy may be pointed out as the only backward years of the O. V. C. As in the case of all veterinary colleges, it had outlived its urban location and besides, to be faithful to veterinary history, it unfortunately fell under incompetent management. When C. D. McGilvray took hold in 1918, 6,000 alumni breathed a sigh of relief. The famous school could now go forward in stride, and did.

Here in all propriety, one may write some unprinted history bearing on the general trend of veterinary education, from urban to rural, as well as upon snapping the old school out of a temporary sickness. Obviously rated as not important in the political circle, the O. V. C. was about to be crowded out of its quarters on University avenue by the "liquor bureau" (we're told), whereupon Principal McGilvray, with tongue in cheek, traded the mislocated structure for 15 acres and a suitable building to be erected at Guelph, "where," says McGilvray, "it should have been in the first place." David Harum never made a more clever horse trade. The rumor that the college would lose its university relationship was indeed just a rumor for, on the contrary, it has become one of the University's valued assets in the fields of learning, research, public health, and agriculture. The building and the formal ceremonies attending its dedication in July, 1948, testify not only to that effect but also, with its predecessors shown herein, to the progress of veterinary medicine in the New World.

Fig. 8—Posed for the department of public relations, O.V.C.
Front row (left to right)—Pathologist Roland Gwatkin, Hull, Quebec; Editor L. A. Merillat, Chicago; Principal A. L. MacNabb, Guelph.
Back row (left to right)—President E. F. Johnston, O.V.M.A.; President L. A. Gendreau, O.V.M.A.; Prof. R. A. McIntosh, O.V.C.; Prof. F. W. Schofield, O.V.C.

THE DEDICATION

The formal dedication ceremony took place in Memorial Hall at 3 p.m., July 6, with Principal A. L. MacNabb of the Ontario Veterinary College presiding. Following his address of welcome, A. B. Fennell, spokesman for the University of Toronto, and L. A. Merillat, editor-in-chief of the AVMA publications, delivered extemporaneous addresses on the significance of the occasion. Greetings to the veterinary profession were given by C. E. Burke, dean of Arts and Sciences, MacMaster University; R. D. Defries, director of the School of Hygiene, University of Toronto; O. G. Edholm, faculty of medicine, University of Western Ontario; and the Hon. T. L. Kennedy, minister of agriculture. The national anthems, *Dominion of Canada* and *The Star Spangled Banner*, and an impressive benediction by the Rev. Canon S. H. Brownlee symbolized the dignity of the five-day celebration.

The banquet in Creelman Hall was a feast for the gourmet superimposed on an evening of modest glamour and classical entertainment. The Loretto Academy Choristers, of 75 teenage girls in white dinner gowns marching to the stage in single file to render vocal selections, will long be remembered as a highlight of the dedication. John Fisher, CBC commentator, took the troubled world apart for analysis; C. D. McGilvray looked into the lives of some of the older alumni; and this reporter closed the speaking with remarks on "this and that." Group singing kept the air ringing with good cheer and best wishes for the O. V. C.

The exercises closed in Memorial Hall on Friday, July 9, with an Agricultural Day under the gavel of C. D. Graham, deputy minister of agriculture of Ontario. Participating were: E. S. Archibald, director of the Federal Experimental Farms, Ottawa; L. C. Ferguson, bacteriologist, Ohio State University; the Hon. T. L. Kennedy, minister of agriculture of Ontario; James Farquharson, Fort Collins, Colo.; Mark Welsh, Pearl River, New York; Sir Daniel Cabot, chief administrative veterinary officer, British Ministry. A radio broadcast by Rex Frost, a showing of "Valiant Years," film of the Associated Serum Producers, a tour of the buildings, and a livestock parade closed the historic five-day session. Details of the literary program and of other features are too lengthy for this restricted space. The scientific program will be reported in the October JOURNAL.

Film Strips

It is a pleasure to report that a set of the three film strips released by the Veterinary Division of the U. S. Public Health Service, and their accompanying transcribed scripts, has been made available to the Motion Picture Library of the AVMA. A film strip projector and a record player is also provided. The films are titled "The Fight Against Rabies," "Laboratory Diagnosis of Rabies," and "Trichinosis Control."

These are available for use of veterinary groups or for AVMA members to present at meetings of lay groups. However, there is no suitable method of shipping the delicate transcribing mechanism, and the use of the films and the records will therefore be limited to groups sufficiently close to Chicago to call for and return the equipment, or to groups which have available a film strip projector and a record player of sufficient size to handle the extra large records.

The equipment can be carried easily in an automobile, but it may not be trusted to unattended transport in a public conveyance or a common carrier.

AVMA Research Fellows

This is the third in the series of discussions (*see* JOURNAL, July:47; Aug.:187) of the fellowships operating under the supervision of the Research Council of the AVMA, and a listing, in turn, of the fellows who either have completed their work or are receiving support from the Research Fund.

Dr. Melvin J. Swenson

Following is a résumé of the background of Dr. Melvin J. Swenson and the work in which he is engaged at Iowa State College as a research fellow.

Melvin J. Swenson

Melvin J. Swenson, born Jan. 14, 1917; D.V.M. (1943) Kansas State College; Veteri-

nary Corps, U. S. Army three years; AVMA research fellow at Iowa State College (Sept. 1, 1946, probably to July 1, 1949).

SUMMARY OF WORK TO DATE

A survey was made with the possibility in mind of producing growth inhibition in rats through the use of thiamin analogues. These are compounds which are closely related, structurally, to the parent compound, thiamin. Some of them have been shown to compete with thiamin by producing an inhibitory effect on the growth of animals and plants.

The experimental work has been conducted on rats, the analogue used was 0-aminobenzyl-(3)-4-methyl-5-β-hydroxyethylthiazolium chloride hydrochloride. The object of the experiment was to determine the effect of this analogue on the histopathology and on the thiamin content of the tissues. Five groups of weanling rats were fed a basal diet containing no thiamin. As the work progressed, some groups were fed supplements of thiamin and/or the analogue.

As marked symptoms of thiamin deficiency were produced, the tissues were studied. Portions of the liver, kidney, and skeletal muscle were analyzed for thiamin. Sections of the sciatic nerves were observed with a polarizing microscope to detect degeneration of myelin sheaths. Photomicrographs were made. Portions of the brain, spinal cord, liver, kidney, heart, skeletal muscle, and sciatic nerve were fixed and stained according to the Marchi method and with hematoxylin-triosin stain.

From experiments which deal with metabolite analogues, it appears entirely possible that some of them may prove to be specific therapeutic agents. In such instances, it is necessary to build up the concentration of the analogue to the point where it is effective against the causative agent of disease but still is not injurious to the host.

A paper dealing with the chemistry and the growth phase of Dr. Swenson's research project has been filed for publication in the *American Journal of Veterinary Research*. The histopathology will be discussed upon completion of the work.

Humane Act Award

The final selection of the members of the Humane Act Award Committee for this year's winner is 15-year-old Richard Swank, Hopkins Road, Mentor, Ohio. Richard, after rescuing a half-frozen female puppy from a railroad track, took it to a veterinarian to be treated for pneumonia. After paying the veterinarian from his meager funds, earned through a newspaper route, he found his mother would not allow him to keep the pup because it was a female. Richard, not to be frustrated, and he and his mother having funds for only the bare necessities, set about earning extra money to have the pup spayed. The result—a healthy dog and a happy boy.

STUDENT CHAPTER ACTIVITIES

Colorado Chapter.—During the spring quarter, the Junior AVMA of the Colorado A. & M. College, held four meetings. The films, "Control of Brucellosis in Swine" and "Pullorum Disease Eradication," were shown and Dr. R. F. Bourne gave a lecture and demonstration on hypnotism. Dr. L. C. Moss discussed "Splenectomy in the Dog" (with illustrations). It was voted to hang pictures of Drs. Bourne and Newsom in the main building in appreciation of the outstanding work they have done in the Division of Veterinary Medicine, at Colorado A. & M. College.

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History of the Ontario Veterinary College Student Chapter of the AVMA.—Early in 1940, the Ontario Veterinary Association sponsored a plan for a student organization and nominated a committee to formulate the aims and objectives of such an organization. The objectives were to demonstrate the value of organized effort, to provide additional opportunity for members to gain professional knowledge, and to encourage graduates to join recognized professional groups.

In the beginning, meetings were conducted jointly with those of the Science Association, and technical papers were presented by senior students and outside speakers. At this time, membership was limited to students of the senior class but later was open to all undergraduate students who wished to join. Undergraduate students now comprise more than three-quarters of the Chapter membership. In 1947, the Student Chapter joined with the other associations of the College and turned over its financial program to the Students' Administrative Council. Now, every student of the College is automatically a member of the Association.

One meeting is held each month and an annual banquet and dance are sponsored by the Student Chapter. Men prominent in veterinary medicine and in related fields are invited to speak at these meetings.

Officers are elected by ballot during the spring term. They comprise a president and vice-president from the senior class; a secretary and treasurer from the junior class; and one representative each from the sophomore and freshman classes. These are the organizing members but, in many projects that are established, all members of the student body who are interested join in and form the actual working committees. During the past few years, prizes have been awarded for general proficiency to the high-standing students of each year.

Some of the speakers this year have been Drs. C. D. McGilvray, formerly principal of Ontario Veterinary College; J. G. Black, on leave from his position as assistant director of Veterinary Services in British Guiana; and Edith Williams, Toronto, who was the first woman to

address the Ontario Association. Films from the AVMA library were also shown at some of the meetings.

The annual banquet, which features a guest speaker and to which every member of the school is invited, officially closes the affairs of the Association for the year. In previous years, the annual dance followed the banquet, but this year, due to the enlarged enrollment, the dance was held on another evening.

Among the projects undertaken by the Chapter this year was the solicitation of complimentary gifts from various manufacturers of veterinary products for each graduating student. The group also donated a sum of money to the College Royal Fair, one of the foremost activities of the combined Ontario Agricultural College and Ontario Veterinary College. A booth for the fair is sponsored annually by the Student Chapter and last year won the Wade-Tool Memorial Trophy, one of the two major prizes offered at the fair.

The wives of students are invited to all of the meetings, but they do not have a separate organization.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BOLONA R., JULIO
Casilla 3814, Guayaquil, Ecuador, S. A.
D.V.M., Ecole de Medecine veterinaire de l'Etat, Brussels, Belgium, 1940.
Vouchers: C. C. Sotomayorn and R. P. Guerrero.

BUCKLEY, FRANK W.
730 E. Main St., Greensburg, Ind.
D.V.M., Indiana Veterinary College, 1920.
Vouchers: V. G. Saylor and T. L. Steenerson.

DONOVAN, JOHN F.
77 Cedar St., Galt, Ontario, Can.
D.V.M., Ontario Veterinary College, 1941.
Vouchers: F. J. Cote and A. F. Bain.

GOVEA, I. GALVAN
Dr. Coss Ote 26; Piedras Negras, Coah, Mexico.
D.V.M., National University of Mexico, 1945.
Vouchers: R. J. Lee and J. del Pozo.

ISBELL JR., WILLIAM J.
P. O. Box 261, Langdale, Ala.
D.V.M., Alabama Polytechnic Institute, 1943.
Vouchers: C. W. Evans and W. J. Isbell.

LANTZ, ROY A.
Woodbine, Iowa.
D.V.M., Kansas City Veterinary College, 1913.
Vouchers: A. C. Drach and H. G. Smith.

LIEBENGOOD, DON M.
704 S. Mill St., Pontiac, Ill.
D.V.M., Kansas State College, 1942.
Vouchers: H. B. Liebengood and G. J. Kruger.

LUNDBERG, FRED O.
Box 613, Wausa, Nebraska.
D.V.M., Chicago Veterinary College, 1917.
Vouchers: P. L. Matthews and F. W. Cairy.

MCCAIN, EARL A.
1504 S. Saddlecreek Rd., Omaha 6, Neb.
M.D.V., McKillip Veterinary College, 1911.
Vouchers: P. L. Matthews and H. A. Seidell.

MARTIN JR., WALTER D.
P.O. Box 1092, Palmyra Rd., Albany, Ga.
D.V.M., Alabama Polytechnic Inst., 1934.
Vouchers: B. E. Carlisle and C. C. Rife.

RILEY, EMMETT T.
Route 2, Hobart, Oklahoma.
D.V.M., Texas A. & M. College, 1935.
Vouchers: C. H. Fauks and H. M. Haines.

STANFORD V., GUILLERMO
Calle de Chopo 265 "C", Mexico, D. F.
D.V.M., National University of Mexico, 1944.
Vouchers: F. Camargo and L. Santa Maria.

TELFORD, ROSWELL A.
Box 478, Watertown, S. Dak.
D.V.M., St. Joseph Veterinary College, 1917.
Vouchers: H. J. McCauley and E. E. Flory.

WENNERGREN, OSCAR
355 N. 4th East St., Logan, Utah.
D.V.M., Ohio State University, 1912.
Vouchers: M. L. Miner and O. G. Larsen

WRIGHTMAN, JOHN H.
Alvinston, Ontario, Can.
D.V.M., Ontario Veterinary College, 1939.
Vouchers: W. Moynihan and D. J. McLellan.

Second Listing

Arms, Robert C., 4 Institute Rd., Burlington, Vt.
Burgess, Stokes H., Box 591, Billings, Mont.
Cottrell, Grant F., 812 Portland Ave., Box 97, St. Paul Park, Minn.
de Araujo, A., Escola Superior de Agricultura, Areias, Estado de Paraiba, Brazil.
Graham, L. M., Rolfe, Iowa.
Lambert, George, Ontario Veterinary College, Guelph, Ontario, Can.
Leonpacher, Louis, Box 888, Lafayette, La.
Parsons, Ralph A., 218 Federal Bldg., Box 1086, Sacramento, Calif.
Ross, Willard J., 4527 Produce Plaza, Union Stock Yards, Los Angeles, Calif.
Soltowski, Janina M., 4509 S. Marshfield Ave., Chicago 9, Ill.
Stanford, Malcolm F., R.F.D., No. 2, Fayetteville, Ark.
Wiggins, Harlan R., Minden, Nebraska.

Second Listing

Alabama Polytechnic Institute

Lockhart, Coy Z., D.V.M., 616 Lee St., Dyersburg, Tenn.

Colorado A. & M. College

Adams, Charles R., D.V.M., Wyoming Hereford Ranch, Cheyenne, Wyo.
Beer, William L., D.V.M., Roanoke, Ill.
Benjamin, Maxine M., D.V.M., West Rockwell Hall, West Laurel, Ft. Collins, Colo.
Bennett, Stephen P., D.V.M., Southern Dairy; Cross, Trinidad, British West Indies.
Berglind, Douglass V., D.V.M., 7006 Cedar St., Huntington Pk., Calif.
Bradford, Francis J., D.V.M., Fonda, Iowa.
Bullock, Alden L., D.V.M., Box 1254, Avenal, Calif.

Christofferson, Paul V., D.V.M., R.F.D., Box 239, Pleasant Grove, Utah.
Grant, Roger A., D.V.M., R.F.D. 1, Chaumont, New York.
Hardenbergh, James G., D.V.M., 500 Sheridan Rd., Evanston, Ill.
Hinshaw, Elbert R., D.V.M., 969 Regent, Boulder, Colo.
Hinze, Phillip M., D.V.M., 220 E. Laurel, Ft. Collins, Colo.
Immenschuh, Jean C., D.V.M., 2125 Evergreen St., San Diego 6, Calif.
Johnson, George O., D.V.M., 701½ S. 16th St., Apt. 4, Omaha, Neb.
Karre, Dale L., D.V.M., Scotia, Nebr.
Kirk, Donald R., D.V.M., 212 West Lake, Ft. Collins, Colo.
Lumley, Jr., Charles S., D.V.M., Buhl, Idaho.
McLellan, Richard A., D.V.M., 5567 Mayberry St., Omaha, Neb.
Meininger, Tildie A., D.V.M., 1818 W. 50 Terrace, Kansas City, Mo.
Menter, John G., D.V.M., P.O. Box 14, Los Banos, Calif.
Miller, Lyle K., D.V.M., Box 48, Wood St., Harmony, Pa.
Minar, Jackson, D.V.M., 2250 S. 12th St., Salem, Ore.
Moffitt, Walter J., D.V.M., 4483 42nd St., San Diego 5, Calif.
Mutz, Virginia F., D.V.M., Eaglenest, N. Mex.
Pattridge, Paul D., D.V.M., 1123 12th St., Golden, Colo.
Pomeroy, Harold E., D.V.M., 185 East 8th St., St. Paul, Minn.
Reid, George R., D.V.M., 832 Washington, Albany, Ore.
Seemann, Carl W., D.V.M., Gaylord, Minn.
Shideler, Robert K., D.V.M., 3007 East Main, Danville, Ill.
Tangeman, Richard B., D.V.M., Box 266, San Dimas, Calif.
Winn, John F., D.V.M., 626 Whedbee, Ft. Collins, Colo.
Wodars, Velma F., D.V.M., 635 North Alisos, Santa Barbara, Calif.

University of Pennsylvania

Smith, Maurice J., V.M.D., 2015 Welsh Rd., Bustleton, Philadelphia, Pa.

University of the Philippines

Solis, Antonio A., D.V.M., Bukidnon National Agricultural School, Musuan, Bukidnon, P. I.

Texas A. & M. College

Buck, Louis E., D.V.M., 722 S. Sequin St., New Braunfels, Tex.
Gore, Harold L., D.V.M., Box 675, Clermont, Fla.
Hornickel, Edward P., D.V.M., Office of State Veterinarian, War Memorial Bldg., Little Rock, Ark.
Humble, Pierce A., D.V.M., Rt. 1, Box 185, Belen, N. Mex.
Jones, Hudson, D.V.M., 12814 Market Street Road, Houston 15, Tex.
Lowe, Max W., D.V.M., R.F.D. 2, Clay City, Ind.
Rosser, Billy W., D.V.M., 1533 North Grand, Enid, Okla.
Trahan, Willie L., D.V.M., Box 607, Schulenburg, Tex.

1948 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Texas A. & M. College

GRAY JR., ROBERT N., D.V.M.
Box 341, Colorado City, Tex.
Vouchers: J. D. Williams and W. F. Juliff.
KEARBY, JEROME B., D.V.M.
2833 W. Seventh St., Fort Worth 7, Tex.
Vouchers. V. B. Robinson and H. T. Barron.
MCCOY JR., ROBERT P., D.V.M.
P.O. Box 163, Taylor, Tex.
Vouchers: R. D. Turk and H. T. Barron.
ROTH, EARL E., D.V.M.
P.O. Box 1326, Bay City, Tex.
Vouchers: H. T. Barron and R. D. Turk.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. BAI are reported as of June 10, 1948, by Chief B. T. Simms.

TRANSFERS

Julius W. Amsiejus, from Albuquerque, N. M., to Phoenix, Ariz.

William B. Chapman, from Piqua, Ohio, to Peoria, Ill.

Merwin L. Crans, from Marshalltown, Iowa, to Nampa, Idaho.

Wilford J. Cross, from Oklahoma City, Okla., to Salt Lake City, Utah.

Edward H. Fitzgerald, from San Diego, Calif., to Los Angeles, Calif.

Charles Hackenberg, Jr., from Mexico City, Mexico, to Oklahoma City, Okla.

Harold W. Householder, from Marshalltown, Iowa, to Des Moines, Iowa.

Martin Kagan, from Newport, Vt., to Boston, Mass.

Bruce Kester, from Albany, N. Y., to Dayton, Ohio.

Jacob L. Medaris, from Oklahoma City, Okla., to San Francisco, Calif.

William M. Moulton, from Montpelier, Vt., to Newport, Vt.

Benjamin H. Parkhurst, from Detroit, Mich., to Philadelphia, Pa.

Ralph A. Parsons, from Nampa, Idaho, to San Francisco, Calif.

Virgil W. Routzong, from Peoria, Ill., to Piqua, Ohio.

Luke R. Sinclair, from Duluth, Minn., to San Francisco, Calif.

Willard O. Tucker, from Omaha, Neb., to Fort Worth, Texas.

Oscar M. Vorthman, from Dubuque, Iowa, to Omaha, Neb.

Asa L. Walker, from Mexico City, Mexico, to Nashville, Tenn.

Clifford W. Wilder, from Raleigh, N. Car., to Albany, N. Y.

RESIGNED

Frank J. Bush, Mexico City, Mexico.
J. Kenneth Keim, Mexico City, Mexico.
Merrill L. Steele, Omaha, Neb.
Charles D. Stumpff, Topeka, Kan.
Robert C. Sweetser, Mexico City, Mexico.

RETIRED

Smith V. Ewers, Fort Dodge, Iowa.

DEATH

Nelson J. Mayer, Pierre, S. Dak.
Garrett J. Roosink, San Antonio, Texas.
Columbus L. Wrinkle, San Francisco, Calif.

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Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. BAI are reported as of July 26, 1948, by Chief B. T. Simms.

TRANSFER

Vernon F. Ziebell, from Madison, Wis., (BAI) to the Department of National Defense.

RESIGNED

Arthur Baumgarten, Philadelphia, Pa.
Charlie B. Bucy, Fort Worth, Texas.
John R. Cobble, Mexico City, Mexico.
Peter T. Curran, Los Angeles, Calif.
John R. Gorham, Pullman, Wash.
Harry E. Hubbard, Mexico City, Mexico.
Burnell E. Knisely, Columbus, Ohio.
George Sand, Atlanta, Ga.

RETIRED

Wilbert H. Borchers, Dayton, Ohio.
Michael J. Hastings, Cortland, Ohio.

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Courses in Laboratory Diagnosis of Parasitic Diseases.—As stated in a previous announcement (*see* JOURNAL (March, 1948): 268), a third six-weeks refresher course for laboratory personnel in Laboratory Diagnosis of Parasitic Diseases will be offered during 1948 at the Laboratory Division of the Communicable Disease Center in Atlanta, Ga. The course will be given from October 11 to November 19. The second two-weeks course during 1948 for laboratory directors, senior staff members, and physicians will be held from September 13-24.

This training is open to all grades of employed laboratory personnel. Although first consideration will be given to personnel from the laboratories of state and local public health departments, applicants from hospitals and private laboratories will be considered when vacancies occur. Laboratory directors and senior staff members wishing to attend the six-weeks course may do so.

There is no tuition or laboratory fee, but travel and living expenses must be paid by the individual or his employer.

Applications for the courses should be made as far in advance as possible. Notification of acceptance from this office will be made in sufficient time to allow the student to make arrangements for living accommodations at the earliest possible date. A list of hotels and rooming houses will be sent to applicants at the time of acceptance.

S/SEWARD E. MILLER,
Chief, Laboratory Division.

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New Director of U. S. Plant, Soil, and Nutrition Laboratory.—Dr. Kenneth C. Beeson's appointment as director of the U. S. Plant, Soil, and Nutrition Laboratory at Ithaca, N. Y., has been announced by Dr. W. V. Lambert, agricultural research administrator. Dr. Beeson's work has shown that lack of cobalt in the soil and in the feeds of animals causes recognizable evidence of deficiency.

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Atomic Bomb Commission Formed.—The National Research Council has been directed by the President to form the Atomic Casualty Commission to coöperate with the Japanese in making a long-range study of the survivors of the atomic bomb explosions over Hiroshima and Nagasaki in 1945. It will require twenty-five years before certain vital data can be obtained. The study of the injured has been close and continuous up to the present time in respect to local and somatic injuries.

AMONG THE STATES AND PROVINCES

Arkansas

Quarterly Meeting.—The second quarterly clinical meeting of the Arkansas Veterinary Medical Association was held at Dr. C. D. Labahn's Hospital in Fort Smith on July 22, 1948. Included in the program were demonstrations of artificial breeding technique, application of an external fixation splint to a femur, ear trim of a Boxer, and other interesting procedures.

A complete and varied program was enjoyed by the ladies.

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Livestock Laws Not Adequate.—"Veterinarian Asks Check for Anthrax" heads an article in the *Arkansas Gazette*, which quotes State Veterinarian Campbell on the government's warning to Arkansas stockmen not to sell

cattle within three weeks after vaccination. Though there are grave outbreaks in Mississippi and northern Louisiana, there is no known anthrax in Arkansas, Dr. Campbell states but, according to Dr. Frank Hurlbut, retired BAI veterinarian, so far as intrastate livestock laws are concerned, Arkansas is no more prepared to cope with livestock diseases than Mexico; hard as the state veterinarian tries, he does not have the backing of adequate laws.

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X Disease.—The state veterinarian's office has diagnozed X disease at McRae and Piggott, Ark.

California

Opening for Livestock Inspector.—There is an opening for a livestock inspector to head the San Diego County Livestock Department. Beginning salary is $460 monthly with increases ranging up to $507. Duties of this position include administration of county livestock inspection and direction of a group of veterinary inspectors in such work as is outlined under the California and San Diego County laws relating to livestock and poultry inspection.

Applicant must be at least 25, and not more than 54, years old and a citizen of the U. S. He must have a license to practice in the state of California and must have had three years' experience in inspection of livestock or as a veterinary inspector. With the application for examination, each candidate must file in triplicate a typewritten statement of not more than 2,000 words describing his experience and educational qualifications for the position.

Application forms are obtainable from W. Frank Persons, director of personnel, Room 402, Civic Center, San Diego 1, Calif.

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Dr. Parshall on Championship Rifle Team.—Dr. C. J. Parshall, San Francisco, is a member of the rifle team of American Legion Post 429 which has won the San Francisco League and the California Championships. The record for the season is 13 wins and 1 defeat.

This team turned in a score of 1,531 out of a possible 1,600 for the 1947-1948 season of the National Rifle Association. In competition with 763 teams, it came within one point of achieving a tie for the National Gallery Championship.

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"Acorn Calves".—The term "acorn calves" is widely used by the cattlemen of the Sierra Nevada foothills for various deformities of newborn calves. As to its cause, Hart, Guilbert, Wagnon, and Goss (*California Agric. Exper. Sta. Bull.* 699) hasten to point out that acorns are not a causative factor since the deformations occur in their absence. The condition is described as a nonhereditary maternal malnutrition associated with dry range feed. If helped to nurse, the deformed calves usually live and even reproduce normal offspring. The condition responds to supplemental nourishment.—*From Biological Abstracts.*

Colorado

State Association.—The program planned for the annual fall meeting of the Colorado Veterinary Medical Association to be held in Denver on Sept. 30 to Oct. 1, 1948, includes as speakers Drs. Floyd Cross, K. W. Smith, H. E. Kingman, M. D. Baum, and others. There will be reprints of each paper presented at this meeting for those who attend and for others who are interested. On the evening of September 30, there will be a banquet in honor of Drs. I. E. Newsom and R. F. Bourne.

s/W. P. BLAKE, *Secretary.*

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New Dean of Colorado A. & M.—Dr. Floyd Cross was graduated from Colorado A. & M. in 1915 and was appointed assistant professor of pathology and bacteriology shortly thereafter. In 1940, he was made full professor and appointed head to the Department of Pathology

Dr. Floyd Cross

and Bacteriology, where he remained until July, 1947. When Dr. E. I. Newsom retired as dean of the Division of Veterinary Medicine, Dr. Cross became acting dean. In July, 1948, Dr. Cross was appointed dean of the Division.

Georgia

Association Officers.—At the forty-second annual meeting of the Georgia Veterinary Medical Association in Columbus on July 12-13, the following officers were elected: Drs. W. D. Martin, Jr., Albany, *President;* E. E. Chambers, Rossville, *president-elect;* C. C. Rife, Atlanta, *secretary-treasurer* and *resident secretary* of the AVMA; C. C. von Gremp, Decatur, *delegate* to the House of Representatives of the AVMA; and T. J. Jones, Athens, *alternate delegate.*

s/C. C. RIFE, *Secretary.*

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Dairy Science Meeting.—The meeting of the American Dairy Science Association at the

state university June 14-17 drew an attendance of more than 800. Among the subjects discussed were parturient blood changes and mammary secretions, calf problems, feeding and management, genetics and endocrine studies, vitamins, metabolism, artificial insemination, dry milk, condensed milk, ice cream, pasturization, cheese, 4-H clubs, sanitation, and teaching methods. The meeting was an all around tableau of veterinary science on parade with trade, commerce, and finance.

Illinois

Teamwork.—"More and more veterinarians and farm bureau leaders in this state are thinking in terms of working together," Dr. C. D. Van Houweling told the Illinois Agricultural Association in their April, 1948, news letter.

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Public Relations Activities.—A questionnaire was mailed to farm program directors of radio stations in Illinois inviting suggestions and criticisms on AVMA scripts. All comments were favorable and several requested more program material of this type. Typical are the answers of Allan English, WYBS-FM, Canton, "We use your material and wish to continue. Yours is the only service which gives the information that you do"; and Farmer Bill, WMBD, Peoria, "Material is fine. Give us more of it."

Mr. Alfred Stedman, associate editor of the *St. Paul Dispatch*, in a speech before a farm audience, stressed the importance of coöperation between farm organizations and veterinarians in combating losses from animal diseases.

s/C. DON VAN HOUWELING, *Director Veterinary Medical Relations.*

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Rabies, a Health Menace.—Dr. J. B. Wadsworth, College of Veterinary Medicine, University of Illinois, in a March release, emphasizes that England, Ireland, Sweden, Norway, Denmark, Holland, and Australia have "scored a knockout against rabies. It is time for the United States to control this enemy to public health." Another way to tell it is that ours is a backward country and will stay that way until the opposition by dogdom to federal control of the disease is overcome.

Kentucky

Association Officers.—Twenty-nine-year-old Dr. L. G. Northington, Bandana, was elected president of the Kentucky Veterinary Medical Association at a business meeting of the association in July. He is the youngest man ever to hold the office. Dr. Northington is also president of the Jackson Purchase Dairy Cattle Show, and a member of the AVMA. Last year he served as vice-president of the KVMA. He succeeds Dr. C. Harold Holmes, Lexington, as president. Other officers elected at the meeting were Drs. J. L. Karnes, New Castle, *first vice-president;* J. K. Bushnell, Paris, *second vice-president;* T. P. Strittmatter, Walton, *third vice-president;* Ross Brown, Lexington, *secretary-treasurer;* and J. A. Winkler, Newport, member of the executive committee succeeding Dr. W. M. Coffee, LaCenter, who is delegate to the AVMA Convention; Dr. F. M. Kearns, Louisville, was named alternate.

New officers of the Ladies' Auxiliary to the KVMA are Mrs. J. L. Karnes, New Castle, *president;* Mrs. F. M. Kearns, Louisville, *vice-president;* and Mrs. H. A. Calldemeier, Louisville, *acting secretary-treasurer.*

s/F. M. KEARNS, *Secretary.*

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Jefferson County Society.—The Jefferson County Veterinary Society was organized June 5, 1948, at the home of Dr. Edward M. Lang in Louisville. The charter members are Drs. J. T. Stearns, La Grange; F. H. Riester, Buechel; G. M. Parrish, St. Matthews; William Shuttleworth, Jeffersontown; Jeannette Sams, Middletown; and Alex Harthill, C. A. Roll, F. M. Kearns, T. J. Stearns, H. A. Calldemeier, Edward M. Lang, and H. F. Fleming, Louisville.

Officers of the new organization are Drs. H. A. Calldemeier, *president;* H. F. Fleming, *vice-president;* and F. M. Kearns, *secretary-treasurer.*

The first project of the Society will be an organized fight against rabies.

s/F. M. KEARNS, *Secretary.*

Louisiana

New Legislation.—Two new bills of vital interest to the veterinarian have been passed by the legislature. In one, the Louisiana Livestock Sanitary Board was recreated, providing for a board composed of the commissioner of agriculture, as chairman, and representatives from the Louisiana Veterinary Medical Association, Aberdeen Angus breeders, Brahman breeders, Hereford breeders, Jersey and Dairy Cattle Club, Poultry Improvement Association, Wool Growers Association, and a swine breeder. This Board is to select and employ a veterinarian who will serve as executive secretary and state veterinarian.

The other bill provides for the establishment and operation of a diagnostic laboratory. The responsibility of this operation was assigned to the Livestock Sanitary Board and an annual appropriation of $30,000 was made.

s/W. T. OGLESBY.

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Personnel Changes at L.S.U.—The following changes have taken place in the veterinary staff of the Department of Veterinary Science at Louisiana State University: Dr. L. C. Grumbles (TEX '45) will be in charge of poultry research; Dr. R. B. Lank (KSC '42) will supervise the health of college-owned herds and flocks, and devote some of his time to research; Dr. Paul Piercy (ISC '33) has resigned his work on anaplasmosis to become head of physiology and pharmacology at the School of Veterinary Medicine, the University of Georgia.

Aberdeen Angus Field Day.—Dr. and Mrs. A. V. Young were hosts at the annual Aberdeen Angus Field Day at their farm at Grand Cane, La., on July 8. The program consisted of tours of the pastures, demonstrations, and a barbecue. There were more than 300 in attendance.

s/W. T. OGLESBY.

Maryland

Johns Hopkins' New President.—Pursuant to his appointment, Dr. Detlev Wulf Bronk, distinguished physicist and physiologist of the University of Pennsylvania, will assume the presidency of Johns Hopkins University Jan. 1, 1949.—*From Press Reports.*

Michigan

Heads Department of Anatomy.—Dr. M. Lois Calhoun has been appointed professor of anatomy and head of that department to succeed Dr. R. A. Runnells who became professor and head of the Department of Pathology on July 1.

Dr. M. Lois Calhoun

Dr. Calhoun, who was formerly associate professor in the Department of Anatomy, was educated at Iowa State College, receiving her B.S. degree in 1924, M.S. in 1931, D.V.M. in 1939, and Ph.D. in 1945. During the past few years she has had several manuscripts published in scientific journals.

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West Michigan Association.—The West Michigan Veterinary Medical Association met in Marshall at the Hotel Schuler on July 22 for the annual business meeting. Officers elected were Drs. B. C. Hekhuis, Coopersville, *president;* Paul V. Howard, Grand Rapids, *secretary;* and Richard W. Stoxey, Spring Lake, *treasurer.* A sound film on rabies was shown after the business session.

s/GLEN W. REED.

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Examinations for Junior and Senior Veterinarian.—The Detroit Civil Service Commission has announced that examinations will be held for the positions of junior and senior veterinarians with the Detroit Department of Health on Oct. 11, and Dec. 13, 1948. Applications are being accepted from all eligible persons in the U. S.

Salary rate for junior veterinarian is $2,875 to $3,275, annually; for senior veterinarian, $3,432 to $3,909. For further information, address Mr. Ralph Mueller, head personnel examiner, Civil Service Commission, 15th floor, Water Board Building, 735 Randolph St., Detroit 26, Mich.

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The New Brucella Vaccine.—Huddleson's new vaccine to combat bovine brucellosis is being used experimentally in Michigan, and it is expected that 40,000 doses will be injected during the year. The work is under the supervision of Dr. Huddleson and State Veterinarian C. F. Clark. The vaccine is not, at present, available to other states except with certain specific requirements outlined by, and under permit from, the BAI of the USDA. Results will be published upon completion of the experiment.

Minnesota

Blood Samples for Brucellosis Tests.—It has come to the attention of the Minnesota State Live Stock Sanitary Board that in some states laymen are now employed in securing blood samples for official brucellosis tests and, in some instances, tests of such samples by lay personnel are recognized in the official program.

At a recent meeting of the Board, it was reaffirmed that tests for brucellosis of livestock to be shipped into Minnesota are acceptable only if the blood samples are procured and the tests conducted by a graduate veterinarian employed either by the state or federal government, or by a graduate veterinarian approved by the state and federal governments for issuing interstate health certificates, and that health certificates for the shipment of livestock into Minnesota be approved only when the tests are so conducted.

s/RALPH L. WEST, *Secretary.*

Mississippi

Personal.—Dr. Jules L. Arnandez, formerly of Como, Miss., announces the opening of the Panola Animal Clinic in Sardis, Miss.

Missouri

Kansas City Association.—The July 20 meeting of the Kansas City Veterinary Medical Association was held in the Hotel Conti-

nental. The guest speaker of the evening was Dr. Arthur A. Case, Department of Veterinary Science, University of Missouri, who spoke on "Diseases of Swine." An open discussion followed.

s/EARL L. MUNDELL, *Secretary.*

Montana

Association Officers.—Officers elected at the annual meeting of the Montana Veterinary Medical Association in Missoula in June are Drs. G. W. Wright, Billings, *president;* G. A. Morrison, Great Falls, *vice-president;* and E. A. Tunnicliff, *secretary-treasurer* (for the tenth time). Drs. G. W. Wright, G. A. Morrison, E. A. Tunnicliff, R. B. Read, H. W. Jacobson, and F. L. Metcalf are members of the Executive Board and the AVMA delegate to the House of Representatives is Dr. J. W. Safford with Dr. E. M. Joneschild as alternate.

s/E. A. TUNNICLIFF, *Secretary.*

Ohio

Research for Human Beings Benefits Animals.—Dr. Richard D. Larcey, well known Clevland veterinarian and director of the animal hospital at Western Reserve University, in an article in the *Cleveland Press*, June 17, 1948, tells how animals used in research benefit not only the human race but livestock and pets as well. For his knowledge in diagnosing and treating diseases, the doctor of human or animal medicine is dependent upon a group of research scientists who devote most or all of their time to the investigation of human and animal diseases. Dr. Larcey points out that the wealth of information, particularly about dogs, which has been gained through research is entirely available to veterinarians and is constantly being used by them in the treatment of valuable livestock and ailing pets.

Pennsylvania

Keystone Association.—New officers of the Keystone Veterinary Medical Association are Drs. James Mark, Villanova, *president;* Joseph Shute, Doylestown, *vice-president;* Rex Brooks, West Chester, *recording secretary;* and Raymond C. Snyder, *corresponding secretary.* In the July JOURNAL, the outgoing officers were erroneously reported as being newly elected.

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Artificial Insemination.—Artificial insemination of cows increased 42 per cent in 1947 over 1948. Nineteen thousand farmers had 125,000 cows artificially inseminated in 1947, according to a report of Pennsylvania State College. —*From Hoard's Dairyman.*

Puerto Rico

Annual Meeting.—The annual meeting of the Sociedad Insular de Médicos Veterinarios was held at the Department of Agriculture and Commerce Building, Santurce, Puerto Rico, on June 5-6, 1948.

The officers elected for 1948-49 were: Dr. O. A. López-Pacheco, *president;* Dr. Fernando E. Armstrong, *vice-president;* Dr. Pedro A. Oliver, *secretary-treasurer;* Drs. Cesar Clavell and Alfonso Rivera, *directors,* all unanimously reëlected. Dr. Jaime Bagué was appointed honorary advisor of the Association.

The following program was presented:

Arturo Ortiz Toro (LL.B.): The Veterinary Profession Organized as a College.

Dr. José Rivera Anaya: The Veterinary Profession as Seen by a New Graduate.

Dr. Luis A. Montañez-Rivera, San Juan: The Future of the Veterinary Profession in Puerto Rico.

Dr. César Clavell, San Juan: The Control of Bovine Tuberculosis, Bovine Brucellosis, and the Tick Eradication Programs in Puerto Rico.

Dr. O. A. López-Pacheco, Hato-Rey: Annual Report of the Association for the Year 1947-48.

An informal luncheon was held after the scientific session was concluded.

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Dr. Muñiz for State Board.—Dr. Carlos M. Muñiz (OSU '35) was recently appointed as a member of the Board of Veterinary Examiners by the governor of Puerto Rico.

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Campaign Against the Indiscriminate Distribution of Veterinary Preparations to the Laity.—At the last meeting of the Board of Directors of the Sociedad Insular de Médicos Veterinarios, plans were discussed to launch a strong campaign against the sale of veterinary biological and pharmaceutical products to laymen by several well-known firms of the United States that advertise "sales to the graduate veterinarian only." Visiting veterinarians have found that dangerous and potent drugs and biological products are constantly being used by farmers.

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Basic Pay for Veterinarians in the Insular Government Increased.—Through the efforts of the Sociedad Insular de Médicos Veterinarios, the basic pay for veterinarians in the employment of the Insular Government was increased more than 25 per cent. Main considerations submitted by the association to the Board of Personnel in an extensive memorandum were the increased cost of living, equipment, and education.

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Dr. Menéndez Attends U. of P. Celebration.—Dr. F. Menéndez Guillot (UP '18) attended the celebration of the reunion of the class of 1918 at the School of Veterinary Medicine, University of Pennsylvania, Philadelphia, in June.

s/O. A. LÓPEZ-PACHECO, *President.*

Utah

Forgotten Grasshopper Bait Kills Stock.—A load of grasshopper bait dumped on the George Carroll ranch at Altonah several years ago was responsible for the recent loss of 24 prize

Hereford cattle, according to the *Western Livestock Journal* (Apr. 29, 1948). Drs. John I. Curtis, state veterinarian, and D. A. Osguthorpe, both of Salt Lake City, made the diagnosis, which was confirmed by laboratory examinations.

Virginia

Southern Association.—The thirty-first annual meeting of the Southern Veterinary Medical Association will be held in the John Marshall Hotel in Richmond, Va., on October 11-13. In addition to the business meeting and scientific program, a post-convention trip to Williamsburg and Yorktown is planned. Dr. Taylor P. Rowe is committee chairman. A complete program is planned for the ladies.

s/A. A. HUSMAN, *Secretary.*

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Dr. Sipos Appointed Acting State Veterinarian.—Appointment of Dr. A. J. Sipos, member of the state BAI, as acting state veterinarian has been announced by L. M. Walker, Jr., commissioner of agriculture. He will succeed Dr. H. C. Givens, who died recently, until the meeting of the Board of Agriculture in the fall, at which time a permanent appointment will be made.

Dr. Sipos received his degree of D.V.M. from George Washington University in 1916. He worked as field inspector for the U.S. BAI for eight years and has practiced in Petersburg and Johnstown, Pa.

Entering the Army in 1942 with a reserve commission as a captain in the reserve corps, he was released in 1946 with the rank of major. Recently, he has completed a tour of active duty at the Research and Graduate School of the Army Medical Center at Walter Reed General Hospital.

For five years, Dr. Sipos has served as secretary of the Virginia State Veterinary Medical Association; he is also a member of the AVMA.

Wyoming

No Brucellosis Here.—"We haven't only controlled brucellosis at the Wyoming Hereford Ranch—we've completely eliminated it." This statement comes from Dr. H. E. Kingman, Sr., ranch veterinarian, quoted in *Western Livestock Journal* (Apr. 29, 1948). Ever since 1935, the ranch has been accredited as brucellosis-free. In recent U. S. BAI tests of 1,600 head of WHR cattle of all ages, not a single reactor was found.

FOREIGN

Australia

Unauthorized Use of "Veterinary."—Under the Veterinary Surgeon's Act of 1923, no person may use the word "veterinary" in connection with his business unless he is a registered veterinary surgeon. A company in New South Wales was ordered to discontinue the use of the word in connection with an animal health service it conducts.—*Austr. Vet. J.*

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Socialized Medicine.—"Unlike New Zealand," says the London correspondent to the *Journal of the American Medical Association*, "Australia has defeated the government's scheme for a state medical service." Defeated in that movement, the government has concocted a scheme to provide free medicine, which is also opposed by the medical profession.—*From correspondents to the American Medical Association.*

Belgium

Doctors Fight Government.—The revolts of physicians against government interference with their affairs appears to be global in scope. Here, the physicians threaten a nation-wide revolt if the government enforces its regulations on the keeping of a fiscal notebook on the fees collected from patients entitled to insurance, and on the nature of the fee collected. In a referendum, the physicians voted 8,000 to 0 against the measure. If the law is enforced, the medical profession will go on an administrative strike, according to published reports.

France

International Congress on Sulfur.—An international congress on sulfur, sponsored by the Minister of Public Health, will be held at Cauterets, High Pyrenees, September 13-15. The agenda include, sulfur metabolism, sulfur deficiencies, sulfur endocrinology in respiration, voice, liver, and rheumatism, sulfur therapy, and other relationships of the ubiquitous element.

Germany

Present Status of the Veterinary College at Munich.—The Veterinary College at the University of Munich was closed by the nazi government in 1939, and was totally destroyed during the war, but, since 1946, it has been reconstructed. The institutes of the College were rebuilt by the students themselves, and, with the aid of the U. S. Military Government, new connections have been established with other European veterinary schools and scientists. Although the teaching staff is still incomplete, there are more students now than before the war. In 1938, there were 250 students registered at the College; the present enrollment is 750.

s/DR. WALTER KOCH
Institut fur Tierzucht der Universitat Munchen.

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Death of Dr. Seifried.—Dr. Oskar Seifried died suddenly of a heart attack in Munich on Dec. 13, 1947. He received his education in Munich and at the Zwick Institute at the University of Giessen. Four years after his formal admission to the faculty at Giessen in 1925, he came to the United States where he spent three years in research at the Rockefeller In-

stitute at Princeton, N. J. Seifried declined a position at Rockefeller Institute and in 1933 became the successor to Kitt as professor of veterinary pathology at Munich. It was through his work in this country and at Munich that he became well known as a research worker, teacher, and author. Among his works are "The Most Important Diseases of Rabbits" (1927), "A Course in Histopathology" (1934), and "Vitamins and Vitamin Deficiency Diseases of Domestic Animals" (1943). He also completed the revision of Kitt's "General Pathology" in 1943, but due to delays caused by wartime conditions in Germany, he did not live to see the publication of this book.

s/DR. WESTHUES, *University of Munich.*

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Pen Pal Wanted.—You will be astonished to get a letter from a German veterinary student. For some months, I have tried without success to get an American student of veterinary medicine who wishes to exchange letters with a German student. I would be very glad if you can send me the addresses of any such students who may be interested. I thank you always now for your kindness.

Hermann Sackmann
Krs. Rotenburg/Hann
British Zone, Germany

Great Britain

Socialized Medicine Wins Approval.—Notwithstanding the plebiscite of 1947 that showed strong disapproval of the government's scheme for a national health service, the Representative Body of the British Medical Association has now accepted the scheme by a plurality lacking only ten votes of a majority. The change of front, according to published reports, was due to the large percentage of physicians who had already joined under the previous National Health Insurance Act (26% in England and 36% in Scotland), and the fear of losing compensation by remaining outside of the National Health Service. It was a case of "sign or starve," says the London correspondent of the American Medical Association (*J.Am.M.A.*, July 3, 1948: 900).

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The Sale of Good Will.—Under the National Health Act, a physician is not permitted to sell the good will of his practice. Prominent authorities insist that the movement to regiment the practice of medicine to that extent infringes on individual freedom.

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Nostrum Ads.—Because of the noninterference to the exaggerated, if not entirely fictitious, claims made for proprietary medicine, makers, distributors, and publishers have adopted a code of ethics to purify their own atmosphere, according to the London correspondent to the American Medical Association (July 26, 1948).

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World-Wide Feed Shortage.—British feed men (*Feed Stuffs*, June 5, 1948) confirmed the unfortunate news that crop failures in Russia, Argentina, and Australia are responsible for the shortage of the cereal grains needed for the feeding of animals. Supplies of 1948 can do little more than offset the poor crops of 1947 in these countries and, therefore, have slowed down the government's program for the expansion of Britain's agriculture.

The Netherlands

Death of Dr. Wester.—Dr. Jurgen Wester was born at Finsterwolde, The Netherlands, Jan. 3, 1869. He received the certificate of veterinary surgeon in 1893, and was a general practitioner for fourteen years, during which time he introduced prophylactic inoculation against swine erysipelas into his practice. In 1907, he joined the faculty of the School of Veterinary Science at Utrecht.

He was an inspiring teacher, a prolific writer, and an indefatigable worker. Among his research findings, working out the life cycle of *Strongyloides westermani* was recognized as outstanding, particularly since this included demonstration of penetration of the larvae through the unbroken skin.

His service to his country was recognized when he was granted the Order of Knighthood upon the occasion of the tercentenary festival of the veterinary college at Utrecht. Dr. Wester died Nov. 20, 1947, after a short illness.

Philippine Islands

Tanauan Veterinarian Joins U.P. Faculty.—Dr. José B. Aranez (PHIL '46), from Tanauan, Batangas, has joined the faculty of the College of Veterinary Science, University of the Philippines, as a member of the Department of Veterinary Surgery and Medicine.

Dr. José B. Aranez

Presently, he is the youngest member of the College. Dr. Aranez is a member of the American Veterinary Medical Association and is its resident territorial secretary in the Philippines.

Turkey

The Rabies Situation.—Since 1933, 57 persons have died of rabies and 41,225 have received antirabic treatment at the 80 antirabic stations established. Delayed treatment among rural people accounted for most of the vaccinal failures. The Semple method has superseded the Hogyes-Philips and Pasteur methods formerly employed. Though rare, cases in horses, cattle, mules, chickens, and donkeys were recorded, but none were reported in turkeys, geese, ducks, and camels. Though 600 to 700 stray dogs and 300 to 400 stray cats are killed monthly in Ankara alone, the number does not diminish owing to new arrivals. Contrary to former times, the people have been made so aware of the dangers that they rush in for treatment at the slightest excuse, but continue to protest the killing of their pets. Veterinary stations vaccinate pets free of charge.—*Ankara Correspondent to the American Medical Association, July 17, 1948.*

COMING MEETINGS

American Association for the Advancement of Science. Centennial Meeting, Washington, D. C., Sept. 13-17, 1948. J. M. Hutzel, 1515 Massachusetts Ave., N.W., Washington 5, D. C., assistant administrative secretary.

Georgia Coastal Plain Experiment Station. Annual short course for veterinarians, the Experiment Station, Sept. 16-17, 1948. W. L. Sippel, Georgia Coastal Plain Experiment Station, Tifton, Ga., Department of Animal Diseases, head.

Southeast Missouri Veterinary Medical Association. J. V. Moore's Animal Hospital, Hayti, Mo., Sept. 29, 1948. F. A. Stepp, 405 N. St., Sikeston, Mo., secretary.

Colorado State Veterinary Medical Association. Annual meeting. Shirley Savoy Hotel, Denver, Sept. 30-Oct. 1, 1948. W. P. Blake, 2410 8th Ave., Greeley, Colo., secretary.

Purdue University. Annual Short Course for Veterinarians. Purdue University, Lafayette, Ind., Oct. 6-8, 1948. C. R. Donham, Department of Veterinary Science, Purdue University, head.

Southern Veterinary Medical Association. Annual Meeting. John Marshall Hotel, Richmond, Va. Oct. 11-13, 1948. A. A. Husman, 320 Agriculture Bldg., Raleigh, N. Car., secretary.

U. S. Livestock Sanitary Association. Shirley Savoy Hotel, Denver, Colo., Oct. 13-15, 1948. R. A. Hendershott, 1 West State St., Trenton 8, N. J., secretary.

Eastern Iowa Veterinary Association. Annual meeting. Hotel Montrose, Cedar Rapids, Iowa. Oct. 14-15, 1948. Laurence P. Scott, Waterloo, Iowa, secretary.

New England Veterinary Medical Association, Annual meeting. Boston, Mass., Oct. 14-15, 1948. C. Lawrence Blakely, 180 Longwood Ave., Boston, Mass.

South Dakota Veterinary Medical Association. Annual Meeting, Carpenter Hotel, Sioux Falls, S. Dak., Oct. 21-22, 1948. R. M. Scott, 1501 S. Main Ave., Sioux Falls, S. Dak., secretary.

Minnesota State University. Conference on animal nutrition, Oct. 25-26, and conference for veterinarians, Oct. 27-28, 1948. University Farm on the St. Paul campus. Willard L. Boyd, Department of Agriculture, University of Minnesota, St. Paul 1, Minn.

Pennsylvania State Veterinary Medical Association. Annual meeting. Penn Harris Hotel, Harrisburg, Oct. 27-29, 1948. Raymond C. Snyder, Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

American Public Health Association, Boston, Mass. Nov. 8-12, 1948. R. M. Atwater, 1790 Broadway, New York City 19, N. Y., executive secretary.

Executive Board of the American Public Health Association. Annual meeting at Boston, Mass., Nov. 8-12, 1948. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, N. Y., executive secretary.

Mississippi Valley Veterinary Medical Association. Hotel Pere Marquette, Peoria, Ill. Nov. 9-10, 1948. W. J. Angerer, Box 23, Atkinson, Ill.

Interstate Veterinary Medical Association. Annual meeting. Hotel Martin in Sioux City, Iowa, Nov. 18-19, 1948. H. C. Smith, 2415 W. Solway, Sioux City, Iowa.

American Society of Animal Production. Annual meeting. Sherman Hotel, Chicago, Ill., Nov. 26-27, 1948. H. M. Briggs, Oklahoma A. & M. College, Stillwater, Okla., secretary.

Research Workers in Animal Diseases of North America, Conference of. Palmer House, Chicago, Ill., Nov. 29, 1948. Dr. W. H. Feldman, Mayo Foundation, Rochester, Minn., secretary.

Nebraska State Veterinary Medical Association. Annual meeting. Cornhusker Hotel, Lincoln, Nebr., Dec. 8-9, 1948. L. V. Skidmore, College of Agriculture, Lincoln 1, Nebr., secretary.

New York State Veterinary College. Annual Conference for veterinarians. Jan. 5-7, 1949. W. A. Hagan, 320 The Parkway, Ithaca, N. Y., president.

Illinois State Veterinary Medical Association. Annual meeting. Abraham Lincoln Hotel, Springfield, Ill., Jan. 26-28, 1949. A. G. Misener, 6448 N. Clark St., Chicago 26, Ill., secretary.

American Veterinary Medical Association. Annual convention. Book-Cadillac and Statler Hotels, Detroit, Mich., July 11-14, 1949. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Chicago Veterinary Medical Association. Palmer House, Chicago, Ill., the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Houston Veterinary Medical Association, Houston, Tex., the first Thursday of each month. Edward Lepon, Houston, Tex., secretary-treasurer.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.

New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

Saint Louis District Meetings. St. Louis, Mo., the first Friday of June and November, W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

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Foreign Congresses

National Veterinary Medical Association of Great Britain and Ireland. Southport, England. Sept. 8-15, 1948. F. Knight, 36, Gordon Sq., London, W. C. 1, general secretary.

Fourteenth International Veterinary Congress. London, England, Aug. 9-14, 1949. Professor L. de Blieck, Kwartellaan 51, The Hague, Netherlands, general secretary, Permanent Committee. (J. G. Hardenburgh, 600 S. Michigan Ave., Chicago 5, Ill., U. S. Committee.)

VETERINARY MILITARY SERVICE

Army Veterinary Officer Elected to the Order of Vasco Núñez de Balboa of Panama.—Col. Daniel S. Stevenson, V. C., U. S. Army, detailed to duty as veterinary advisor to the Minister of Foreign Affairs of the Republic of Panama, was, on Apr. 26, 1948, elected to the Order of Vasco Núñez de Balboa of Panama. The national decoration, in the grade of Commendador, was conferred upon Colonel Stevenson by Mr. Guillermo Mendez P., the Panamanian Minister of Agriculture, Commerce, and Industries, and acting chancellor of the Order, in a ceremony held in the office of foreign relations.

Colonel Stevenson was first detailed to Panama in December, 1946, at the time that an unusually severe epizoötic of equine encephalomyelitis was reported in horses in the central provinces. The epizoötic was soon moderated by effective, modern means of preventive veterinary medicine. Since then, Colonel Stevenson has played on important rôle in formulating, advising, and assisting in the development and operation of a well-rounded veterinary program related to a veterinary educational system, animal and livestock industries, and the public health services of the Republic of Panama, particularly through its Department of Agriculture. The recognition of the services of Colonel Stevenson reflects on the success of the United States military mission to Panama.

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Captain Abbott Receives Award.—By direction of the Secretary of the Army, under the provisions of AR 600-45, the Army Commendation Ribbon was awarded to Capt. William L. Abbott, V.C., U. S. Army, for meritorious service during the period of June 24, 1945, to July 6, 1945.

Captain Abbott served in the Alaskan Department from 1944 to 1947. Since his return to the United States he has been stationed at the Army Medical Center, Washington, D. C. His home is in Downers Grove, Ill. He received his D.V.M. degree from The Ohio State University in March, 1943.

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Col. Joseph H. Dornblaser Retired.—Col. Joseph H. Dornblaser (MC K '17), Fort Reno, Okla., was placed on the retired list of the Army effective July 31, 1948, upon his own application. Colonel Dornblaser was commissioned a second lieutenant in the Veterinary Reserve Corps on Aug. 6, 1917, and has been promoted through the grades, obtaining his colonelcy on Sept. 16, 1943.

During World War I, Colonel Dornblaser was on duty with the Eighty-sixth Division and served with the AEF from Sept. 17, 1918, until June 30, 1919, and upon his return to the U. S. was assigned to Fort Riley, Kan., for duty as instructor at the Medical Service School. Upon his graduation from the Army Veterinary School in 1922, he was assigned to Fort Huachuca, Ariz. Since his return from a tour of duty in Panama in 1931, Colonel Dornblaser has served in various station assignments in the U. S., his principal duties being remount and breeding service activities. During World War II, Colonel Dornblaser served in the Southwest Pacific area from May, 1942, until August, 1944. At the time of his retirement he was on duty with the South Central Remount area, Fort Reno, Okla.

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Col. Raymond T. Seymour Retired.—Col. Raymond T. Seymour (KCVC '15), Chicago, Ill., was placed on the retired list of the Army effective July 31, 1948, upon his own application. Colonel Seymour is also a graduate of the Army Veterinary School, Medical Field Service School, and attended a special course of instruction in the science of breeding and clinics at the University of Kentucky.

He was commissioned a second lieutenant in the Veterinary Reserve Corps Sept. 6, 1917, and has been promoted through the grades, obtaining his colonelcy on June 17, 1944.

With the exception of a tour of duty in Panama, Colonel Seymour's early service was at various stations in the U. S. In June, 1944, he was assigned as Army veterinarian, Tenth Army, going overseas with that unit in August. On October 15, 1945, Colonel Seymour was made chief veterinarian, Heardquarters AFWESPAC, in which capacity he served until his return to the U. S. in October, 1946.

At the time of his retirement, Colonel Seymour was on duty at Headquarters Fifth Army, Chicago, Ill., where he has served as Army veterinarian since October, 1946.

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Remount Service Transferred to Department of Agriculture.—Effective July 1, 1948, the Remount Service of the Quartermaster Corps, Department of the Army, with its records, property, and civilian personnel, were transferred to the Department of Agriculture. The Army Horse Breeding Plan, in operation since the beginning of the fiscal year 1921, was also abolished as a function of the Department of the Army.

The action was effected by the Act of Congress (Public Law 494-80th Congress), approved Apr. 21, 1948, cited in Joint Army and Air Force Bulletin No. 18, Department of the Army and the Air Force, June 7, 1948.

The Act also provides that the Secretary of the Army may detail to the Department of Agriculture, until June 30, 1949, such military personnel, including officers of the Army Veterinary Corps, as he may determine desirable to effectuate the intent of the Act or to safeguard the interests of the nation. In this manner the experiences and the highly professional and specialized skill developed by the Army veterinary service during more than a quarter of a century, in connection with horse breeding and management, will be passed on and continued at least for another year.

The officers of the Army Veterinary Corps now assigned to the four remount depots at Front Royal, Va.; Fort Reno, Okla.; Fort Robinson, Neb.; and Pomona, Calif., representing this phase of Army veterinary medicine include:

Lt. Colonel Russell McNellis (RA)
Major Wilson M. Osteen
Major Harry L. Rubin
Major Wayne D. Shipley (RA)
Major Robert C. Sweetser
Major Richard M. Zirkle
Major Herbert F. Sibert (RA)

BIRTHS

Dr. (KSC '42) and Mrs. Orval H. Meinecke, Hot Springs, Ark., announce the birth of Ada Louise on March 8, 1948.

Dr. (TEX '39) and Mrs. Willard C. Brooks, Prairie Grove, Ark., announce the birth of a son, John Charles, on March 10, 1948.

To Dr. (MSC '42) and Mrs. D. L. Kerlin, Champaign, Ill., a son, Roger Frank, on April 27, 1948.

To Dr. (UP '47) and Mrs. Charles E. Gundlach, Washington, Pa., a daughter, Virginia Lee, on May 3, 1948.

DEATHS

★**Harvey C. Givens** (USCVS '13), 60, Richmond, Va., was drowned while swimming with a party of friends July 3, 1948. Dr. Givens worked for several years in the Federal Meat Inspection Service after graduation and was health inspector for the city of Roanoke, Va., for ten years before his appointment as state veterinarian in 1926. In this position, Dr. Givens headed the Division of Animal Husbandry of the State Department of Agriculture, and was particularly active in fighting Texas cattle fever, brucellosis and bovine tuberculosis.

Dr. Givens was admitted to the AVMA in 1920.

★**Leslie D. Miller** (COLO '44), 25, Longmont, Colo., was killed in an auto accident on June 29, 1948. Dr. Miller entered the Army at the time of his graduation and was separated from it in 1947. He had entered practice with Drs. Harrison and Hargraves in Longmont on June 1, 1948. Dr. Miller was admitted to the AVMA in 1945.

★**Philip P. Poley** (CORN '28), 44, Kingston, N. Y., died June 10, 1948, of a heart attack. He had been meat inspector for the Board of Health since 1930 and was a frequent contributor to various medical and veterinary journals. Dr. Poley had been a member of the AVMA since 1929.

Oskar Seifried, Munich, Germany, died on Dec. 13, 1947. Dr. Seifried was widely known as a research worker, a teacher, and an author.

William Spear (MC G '02), 70, Portland, Me., died May 30, 1948. Dr. Spear was one of the first practitioners to specialize in small animal practice in Maine. He had recently retired from the position of Food Inspector for the City of Portland. He was a member of the Maine Veterinary Medical Association.

★**Cassius Way** (CORN '07), 67, New York, N. Y., died suddenly on Aug. 5, 1948. Dr. Way was a past-president of the AVMA of which he had been a member since 1909.

Jurgen Wester, Utrecht, The Netherlands, died Nov. 20, 1947, after a short illness. Dr. Wester is remembered for his research, particularly in the study of the life cycle of *Strongyloides westermani*.

★**Frank J. Williamson** (ONT '04), 66, Victoria, B. C., Canada, died on May 20, 1948. At the time of his graduation, he joined the Health of Animals Division where he remained until his retirement in December, 1944. Dr. Williamson was admitted to the AVMA in 1919.

★Indicates member of the AVMA.